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Illustrated Genera of **IMPERFECT FUNGI**

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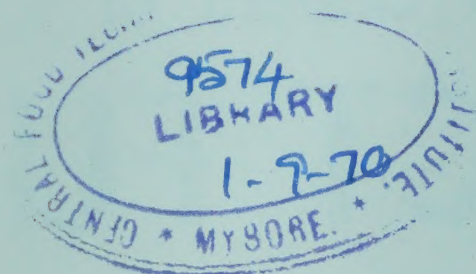
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PREFACE

The economic importance of the imperfect fungi in agriculture, industry and medicine and the frequency with which they are encountered make it highly important that the student of mycology learn to recognize many genera and species of this group. Yet, the study of the Imperfects, which, for all practical purposes, include the asexual stages of many fungi known to produce a perfect stage, is one of the most difficult phases of mycology. This is due, in part, to the necessary arbitrary use of minor or variable characters in separating the form genera. Another contributing factor is the lack of emphasis on the imperfects in most mycology courses.

The uncertainty of the inexperienced person faced with the problem of identifying imperfect fungi can be overcome only by furnishing him with as many tools as possible for identification or recognition of genera and species. This manual is intended as one of these tools. It should be considered as a teaching aid, in the sense of a laboratory manual, rather than a taxonomic treatment of the Class, Fungi Imperfecti. It adds nothing new to the taxonomy of these fungi. It is a collection of illustrations of 302 recognized genera, brought together under the same cover with brief descriptions and a key to genera, so that this information will be more easily available to the student of mycology and plant pathology and to others interested in the imperfect fungi.

This manual had its origin a number of years ago in a few pages of illustrations prepared for use of the mycology student at West Virginia University. Because of the demonstrated value of the illustrations, it has been expanded to its present form. The set of drawings is not complete, as only 302 genera (of the estimated more than 1,000) are included. An effort has been made to place the emphasis on common or important genera, although a number of unusual forms are included. The availability of good illustrations or of material from which drawings could be made was an important factor in the selection of genera and to some extent the representative species.

The drawings which are original with the author, 182 genera, are so indicated in the descriptions. The remaining drawings, for the most part, were traced from the original illustrations to reduce the chance of error. The source of each "borrowed" illustration is given. All of the original drawings were made free hand and all of the drawing work was done by the author. Stippled fungus structures, such as hyphae, conidiophores and conidia, indicate the presence of dark pigment, while hyaline structures are not stippled.

In general, particularly with the original drawings, the appearance of the fungus is shown under different magnifications. The low magnification drawings were usually made by use of the stereoscopic microscope, while the high-dry or oil immersion objectives of the compound microscope were used for the high magnification drawings. No attempt was made to maintain a uniform scale of size or to give actual sizes of the representative species, since this character is of little or no taxonomic value in separating genera and would have little meaning to the student.

Included in the set of drawings and placed first are 19 genera of conidial Phycomycetes which are similar to the Moniliales. These are followed by the Moniliales, Sphaeropsidales, Melanconiales and Mycelia Sterilia. The authorities for the generic names are taken from Ainsworth and Bisby (1). For the most part, synonyms have been omitted, as are discussions of limits and extent of genera. The arrangement of genera within the three main orders is based primarily on the spore characters, such as color, number of cells and shape. Characters of the conidiophores are also used in the Moniliales. These are characters which would be observed first.

A key to the genera illustrated is included for the convenience of the student. It is not entirely original, for authoritative references were used in its construction. More complete keys are given by Clements and Shear (5) and by Bender (2, 3). Ainsworth and Bisby's (1) "A Dictionary of the Fungi" is indispensable for definitions of terms and many other items of information.

The accompanying descriptions are intentionally brief and include only the main characteristics of the genera. They were taken from sources given in the general references. Some references to further information or illustrations are given with the descriptions of genera and references to additional taxonomic works may be found in Bessey (4).

Permission to reproduce published illustrations by various authors, copyright owners and publishers is gratefully acknowledged. Specific acknowledgement of each source is given with the generic description. I wish also to express my appreciation to my colleagues in the Department of Plant Pathology, Bacteriology and Entomology for their helpful suggestions and criticisms during the preparation of this manual. Special thanks are due to Dr. C. R. Orton and to Dr. J. B. Routien for the critical reading of the manuscript.

PREFACE to SECOND EDITION

It is extremely gratifying to the author that so many mycologists and plant pathologists have found this manual useful in identifying the imperfect fungi. Again it should be emphasized that this book is intended primarily as a manual for the student, rather than as a taxonomic work for the experienced mycologist. It is a compilation of brief descriptions and illustrations based on available material or good illustrations in the literature.

The present revision increases the number of genera treated by about fifty per cent and includes a total of 462 genera. Because of the world-wide interest in the imperfect fungi a greater number of genera described from foreign countries have been included. Many of the drawings have been copied from other sources, since material for original study was not easily available. The original sources of all copied drawings are given. The author gratefully acknowledges permission of authors and publishers to reproduce illustrations. Thanks is also due to mycologists at the National Fungus Collections, Beltsville, Maryland, and to others for herbarium material and cultures of several genera from which drawings were made. All of the illustrations were prepared by the author.

If, by the use of this manual, the recognition and identification of some of the imperfect fungi is made easier, the preparation of the manual will have been worth while and its purpose will have been accomplished.

Morgantown, W. Va.
March 1960

H. L. Barnett

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KEY TO INCLUDED GENERA

- A1 Mycelium coenocytic, septa infrequent or absent; conidia present (conidial PHYCOMYCETES)
 - B1 Parasitic on soil-inhabiting rhizopods or nematodes(ZOOPAGALES)
 - C1 Conidia catenulate
 - D1 Conidia in short erect chains on short lateral branches; haustoria lobed*Zoopage*, 3
 - D2 Conidia in long chains; haustoria coiled*Cochlonema*, 6
 - D3 Conidia in long chains; haustoria forked*Bdellospora*, 5
 - C2 Conidia borne singly
 - D1 Conidia borne on slender, upright conidiophores*Stylopage*, 2
 - D2 Conidia sessile; haustoria coiled*Endocochlus*, 11
 - D3 Conidia sessile; haustoria not coiled*Acaulopage*, 4
 - B2 Not parasitic on small, soil-inhabiting animals(MUCORALES)
 - C1 Conidiophores short, tapering, bearing a single conidium or 1- or 2-spored sporangiole*Haplosporangium*, 1
 - C2 Conidiophores (sporangioophores) usually tall, bearing a cluster of conidia
 - D1 Conidiophores bearing sporocladia laterally or terminally; conidia borne only on one side of special spore-bearing branches (sporocladia)
 - E1 Sporocladia borne on coiled or recurved branches
 - F1 Sporocladia on coiled branches; conidia short-ellipsoid*Spirodactylon*, 16
 - F2 Sporocladia in umbels on recurved branches; obovoid*Martensiomyces*, 15
 - E2 Sporocladia not borne on coiled or recurved branches
 - F1 Conidia borne only on lower (outer) side of sporocladium*Coemansia*, 17
 - F2 Conidia borne only on upper (inner) side of sporocladium
 - G1 Conidiophore simple, bearing a few lateral or apical sporocladia*Martensella*, 12
 - G2 Conidiophore simple, bearing a whorl of sporocladia on an apical disk*Kickxella*, 13
 - G3 Conidiophore long, branched, bearing lateral, dome-like sporocladia*Linderina*, 14
 - D2 Conidiophores without sporocladia
 - E1 Conidia produced in rows, or sporangioles breaking up into a row of spores

- F1 Conidiophores non-septate, simple or branched; conidia radiating from enlarged head
 - G1 Conidiophores simple, arising from basal rhizoids *Syncephalis*, 19
 - G2 Conidiophores usually branched; rhizoids absent . *Syncephalastrum*, 22
- F2 Conidiophores septate, repeatedly branched
 - G1 Branches dichotomous, all fertile *Piptocephalis*, 18
 - G2 Branches verticillate, all fertile *Dimargaris*, 20
 - G3 Branches irregular, some ending in sterile tips
 - H1 Fertile branches enlarged, bearing a head of cylindrical sporangioles..... *Dispira*, 24
 - H2 Fertile branches repeatedly branched; sporangioles not in heads..... *Tieghemiomyces*, 21
- E2 Conidia not in rows nor sporangioles breaking up into rows of spores
 - F1 Conidiophores with lateral or terminal branches
 - G1 Spore-bearing head compound; conidia striate, usually colored..... *Choanephora*, 23
 - G2 Spore-bearing head simple; conidia echinulate, hyaline *Cunninghamella*, 9
 - F2 Conidiophores simple
 - G1 Conidia produced apically in a spiral, in a slime drop..... *Helicocephalum*, 7
 - G2 Conidia not produced in slime
 - H1 Conidia on enlarged, globose apex *Rhopalomyces*, 8
 - H2 Conidia borne around a cylindrical upper portion; resembling *Typha*..... *Mycotypha*, 10
- A2 Mycelium not coenocytic, with frequent septa; conidia normally present, except in a few genera..... (FUNGI IMPERFECTI)
- B1 Conidia and conidiophores not produced within a pycnidium or acervulus (MONILIALES)
- C1 Conidia more or less coiled or spirally curved, hyaline or dark (parts of *Moniliaceae*, *Dematiaceae* and *Tuberculariaceae*)
 - D1 Conidiophores free, not in a sporodochium
 - E1 Spore coil more or less fiat; not aquatic
 - F1 Conidial filaments thick in proportion to length; not hygroscopic
 - G1 Conidia dark, with both transverse and longitudinal septa *Xenospora*, 144
 - G2 Conidia hyaline or dark, with transverse septa only

- H1 Conidia in simple coil, not beaked
 - I1 Parasitic on higher plants*Helicomina*, 137
 - I2 Saprophytic on wood and bark*Helicoma*, 136
- H2 Conidia raquet-shaped, terminating in a beak ...*Circinoconis*, 133
- F2 Conidial filaments slender in proportion to length; hygroscopic
 - G1 Conidiophores hyaline, short.....*Helicomycetes*, 141
 - G2 Conidiophores tall, dark.....*Helicosporium*, 140
- E2 Conidia more or less globoid, aquatic
 - F1 Conidium consisting of a hollow, spherical network of branches joined at the tips*Clathrosphaerina*, 131
 - F2 Conidium consisting of branched, separate coils, each coil loosely wound.....*Spirosphaera*, 132
- E3 Spore coil spiral; conidia ellipsoid or barrel-shaped; not aquatic
 - F1 Conidia borne singly*Helicoon*, 143
 - F2 Conidia catenulate.....*Helicodendron*, 145
- D2 Conidiophores forming a sporodochium
 - E1 Conidia coiled in loose spiral.....*Hobsonia*, 139
- E2 Conidial coil flat
 - F1 Sporodochia stalked; conidia hyaline.....*Everhartia*, 138
 - F2 Sporodochia cushion-shaped; conidia dark.....*Troposporella*, 142
 - F3 Sporodochia flat to cushion-shaped; conidia hyaline, with thick wall.....*Drepanoconis*, 135
- ✓C2 Conidia not coiled
 - ✓D1 Both conidia and conidiophores (if present) hyaline or brightly colored; conidiophores not united into sporodochia or synnemata (*Moniliaceae*)
 - ✓E1 Conidia 1-celled, globose to short cylindrical
 - × F1 Conidiophores absent or reduced to phialides or peg-like sterigmata
 - G1 Phialides flask-shaped, in clusters; not pathogenic*Botryophialophora*, 42
 - G2 Conidiophores not distinct; pathogenic to man
 - H1 Filamentous in culture at 25° C.*Blastomyces*, 54
Histoplasma, 56
 - H2 Producing both filaments and yeast-like cells in culture at 25° C.....*Candida*, 30
 - G3 Conidiophores not distinct; commonly soil fungi

- H1 Conidia (oidia) formed by segmentation of mycelium
 - I1 Forming small compact colonies on agar *Streptomyces*, 25
 - I2 Mycelium spreading on agar *Geotrichum*, 26
- H2 Conidia not formed by segmenting mycelium
 - I1 Mycelium with clamp connections
 - J1 Spores not forcibly discharged; attacking microscopic animals *Nematoctonus*, 28
 - J2 Spores forcibly discharged; not attacking microscopic animals *Itersonilia*, 33
 - I2 Mycelium without clamp connections
 - J1 Spores abundant, budding, yeast-like
 - K1 Some spores borne on sterigmata and forcibly discharged *Sporobolomyces*, 32
 - K2 Spores arising from side of mycelium, not forcibly discharged *Candida*, 30
 - J2 Spores few, not budding or yeast-like, hook-shaped, borne on globose phialides *Harposporium*, 39
- ✓F2 Conidiophores present, although sometimes short
 - G1 Cells of conidiophore not differing greatly from the catenulate conidia
 - H1 Conidiophores simple; conidia formed basipetally *Oidium*, 31
 - H2 Conidiophores branched; conidia formed acropetally *Monilia*, 29
 - ✓G2 Conidiophore and its branches distinct from conidia
 - ✕ H1 Conidiophores simple or sparingly branched; phialides, if present, not tightly clustered
 - I1 Conidia catenulate
 - J1 Conidia endogenous
 - K1 Dark chlamydospores absent *Chalara*, 153
 - K2 Dark chlamydospores present, rounded, usually single *Chalaropsis*, 155
 - K3 Dark chlamydospores present, forming a terminal row of short, barrel-shaped cells *Thielaviopsis*, 159
 - J2 Conidia exogenous
 - K1 Conidiophores as short or shorter than the conidia *Polyscytalum*, 45
 - K2 Conidiophores distinctly longer than the conidia

- L1 Flask-shaped phialides present on upper portion of conidiophore *Acrophialophora*, 187
- L2 Phialides absent or on simple pedicels
 - M1 Conidial chains branched..... *Hyalodendron*, 80
 - M2 Conidial chains simple
 - N1 Conidia fusoid *Fusidium*, 62
 - N2 Conidia ovoid *Monocillium*, 68
- I2 Conidia not catenulate
 - J1 Conidia (or scars) both apical and lateral
 - K1 Conidiophores clustered; parasitic on plants..... *Ovularia*, 47
 - K2 Conidiophores single; not parasitic on plants
 - L1 Conidia borne on swollen intercalary and apical cells *Gonatobotrys*, 66
 - L2 Conidia borne on lateral sterigmata, not on swollen cells..... *Meria*, 40
 - J2 Conidia produced only at apex or in apical heads
 - K1 Conidiophores enlarged at apex .
 - L1 Conidiophores not forked, bearing a large number of conidia in a head..... *Oedocephalum*, 38
 - L2 Conidiophores forked near apex, bearing only a few conidia *Glomerularia*, 37
 - K2 Conidiophores not enlarged at apex
 - L1 Conidia borne singly, usually dry
 - M1 Conidiophores as short as conidia; slender sterile hairs present *Circinotrichum*, 44
 - M2 Conidiophores relatively long; no sterile hairs present *Acremonium*, 36
 - L2 Conidia in clusters or heads, dry or moist
 - M1 Conidia mostly ovoid, many in droplets of mucilage *Cephalosporium*, 34
 - M2 Conidia oblong or cylindrical, in small clusters..... *Cylindrocephalum*, 35
- ✓H2 Conidiophores mostly branched, sometimes simple; phialides, if present, in groups or clusters
- ✓ I1 Conidia catenulate
 - J1 Phialides or conidia borne on swollen portion of conidiophore
 - K1 Conidia on phialides in simple, compact head *Aspergillus*, 74

- K2 Conidia on swollen, intercalary or apical cells in loose clusters *Gonatorrhodiella*, 77
- J2 Swollen fertile cells not present
- K1 Conidia borne on phialides, in basipetal chains
- L1 Conidiophores more or less in a layer; conidia in compact columns *Metarrhizium*, 71
Myrothecium, 290
- L2 Conidiophores not in layer; conidia usually in loose chains
- M1 Phialides in brush-like group, not divergent, not tapering
- N1 Conidia truncate at base *Scopulariopsis*, 78
- N2 Conidia globose to ellipsoid, not truncate at base *Penicillium*, 73 ✓
- M2 Phialides divergent, loose, tapering to a tube *Paecilomyces*, 70
Spicaria, 79
- K2 Conidial chains not on definite phialides
- L1 Spores (oidia, arthrospores) rod-shaped, formed by segmenting branches of conidiophore *Oidiodendron*, 63
- L2 Conidia barrel-shaped, not formed by segmentation *Amblyosporium*, 75
- ✓I2 Conidia not catenulate
- J1 Large, conspicuous, rough-walled chlamydospores present
- K1 Chlamydospore with large basal colorless cell
- L1 Conidiophores slender, branched *Mycogone*, 58
- L2 Conidiophores short, stout, simple, bearing a cluster of phialides *Chlamydomyces*, 57
- K2 Chlamydospores without large, colorless basal cell *Sepedonium*, 53
Stephanoma, 55
- ✓J2 Large, rough-walled chlamydospores absent
- K1 Conidia produced apically on phialides or branches of conidiophore
- L1 Branches of conidiophore verticillate (at least the larger conidiophores)
- M1 Conidiophores with some slender elongated sterile branches; phialides short... *Pachybasium*, 61

- M2 Conidiophore branches all fertile, slender, bearing a cluster of conidia apically on wart-like or peg-like structures *Calcarisporium*, 51
- M3 Conidiophore branches all fertile, slender, bearing conidia singly or in mucilaginous heads *Verticillium*, 50
Acrostalagmus, 52
- L2 Branches of conidia not verticillate, irregular
- M1 Aquatic on submerged leaves *Dimorphospora*, 43
- M2 Not aquatic
- N1 Conidia held in heads by slime drops
- O1 Conidiophore brush-like, similar to *Penicillium* *Gliocladium*, 69
- O2 Conidiophore branches spreading *Trichoderma*, 46
- N2 Conidia not in slime drops, dry
- O1 Conidia abundant in loose clusters, usually on thickened tips of branches, on short sterigmata
- P1 Conidiophore tall with central axis and numerous, lateral branches of equal length *Botryosporium*, 67
- P2 Conidiophores tall or short, usually branched irregularly, without central axis *Botrytis*, 65
Phymatotrichum, 76
- O2 Conidia borne single or in small, loose clusters
- P1 Conidia borne on short, peg-like teeth *Hansfordia*, 41
- P2 Conidia not borne on teeth
- Q1 Tufts of sterile hair present *Botryotrichum*, 72
- Q2 Sterile hairs few or absent
- R1 Conidiophore branches usually bearing one or two ovoid conidia . *Monosporium*, 27
- R2 Conidiophores branched; conidia clavate *Cylindrophora*, 48
- ✓ K2 Conidia attached both at apex and on sides of conidiophore or its branches
- L1 Conidia-bearing portion zig-zag, rachis-like in appearance
- M1 Conidiophores long, slender, branches not bulbous at base *Tritirachium*, 60

- M2 Conidiophores clustered on mycelium, bulbous at the base *Beauveria*, 59
 - L2 Conidia-bearing portion not zig-zag or rachis-like
 - M1 Conidia borne on short peg-like structures
 - N1 Fertile portion (cells) thick *Rhinotrichum*, 64
 - N2 Fertile portion of sporogenous cells slender *Calcarisporium*, 51
 - ✓ M2 Conidia not borne on peg-like structures *Sporotrichum*, 49
- E2 Conidia mostly 2-celled, ovoid to cylindrical or irregular
 - F1 Conidiophores absent or not differing from branches of mycelium
 - G1 Conidia lobed *Dendrosporium*, 92
 - G2 Conidia not lobed, upper cell often with a short lateral beak *Rhynchosporium*, 89
 - F2 Conidiophores distinct, branched
 - G1 Conidia ovoid or oblong
 - H1 Conidiophore branched irregularly; conidia held in clusters *Diplosporium*, 90
 - H2 Conidiophore branches mostly verticillate; conidia single *Diplocladium*, 86
 - H3 Conidiophore branches variable; conidia held in irregular, loose chains..... *Didymocladium*, 85
 - G2 Conidia slender, cylindrical
 - H1 Conidia catenulate, held in large slime drops... *Gliocladiopsis*, 93
 - H2 Conidia not catenulate, not in large heads *Cylindrocladium*, 84
 - F3 Conidiophores distinct, simple or sparingly branched
 - G1 Aquatic, submerged *Heliscus*, 83
 - G2 Not aquatic
 - H1 Conidiophores in clusters; parasitic on leaves
 - I1 Conidia cylindrical, frequently in short chains . *Ramularia*, 91
 - I2 Conidia ovoid or oblong, not in chains..... *Didymaria*, 87
 - H2 Conidiophores usually single; mostly saprophytic
 - I1 Conidiophores stout, upper half with spore-bearing, peg-like teeth *Diplorhinotrichum*, 88
 - I2 Conidiophores slender; conidia (conidial scars) few, lateral as well as apical *Piricularia*, 94
 - I3 Conidiophores slender; spore-bearing portion apical or at different levels on conidiophore

- J1 Conidia attached only at the apex *Trichothecium*, 82
- J2 Conidia borne at 2 or more levels on the
conidiophore *Arthrobotrys*, 81
- E3 Conidia mostly 3- or more-celled, globoid to
cylindrical or elongated to filiform with
variable septations
- F1 Conidia long-cylindrical to filiform, somewhat
bent or curved; saprophytic on submerged leaves
- G1 Conidia several-celled, released from conidio-
phore by means of short "separating cells" *Anguillospora*, 116
- G2 Conidia 1- to few-celled, curved, borne on
phialides *Flagellospora*, 110
- G3 Conidia 1-celled, lunate *Lunulospora*, 111
- F2 Conidia not as in F1; not submerged aquatics
- G1 Conidia septations in at least 2 planes
(dictyosporous) *Dictyoarthrinopsis*, 118
- G2 Conidia with transverse septations only, not
branched
- H1 Causing dermatomycoses of man or animals
- I1 Macroconidia clavate, rounded at the apex *Trichophyton*, 108
- I2 Macroconidia spindle-shaped or ellipsoid *Microsporum*, 105
- H2 Saprophytic or parasitic on plants
- I1 Typical large canoe-shaped macrospores
and small microspores present *Fusarium*, 100
- I2 Spores not as in *Fusarium*
- J1 Conidiophores short, simple or sparingly
branched
- K1 Conidia cylindrical to long-cylindrical,
straight
- L1 Conidia in short chains; mostly
parasitic on leaves *Septocylindrium*, 101
- L2 Conidia not catenulate; saprophytic
- M1 Conidiophores simple or sparingly
branched; lobed intercalary vesicles
on mycelium *Hyaloflorae*, 98
- M2 Conidia irregularly branched; no
vesicles on mycelium *Moezzia*, 96
- K2 Conidia ellipsoid, often attenuated or
curved
- L1 Conidia attenuated or pointed
- M1 Conidium with apical appendage *Spermospora*, 103
- M2 Conidium without appendage *Cercospora*, 106

- L2 Conidia ellipsoid, rounded at ends
 - M1 Globose spiny cells (conidia) also present *Euricoa*, 99
 - M2 Globose spiny cells absent *Fusoma*, 104
Mastigosporium, 95
- J2 Conidiophores tall, slender, simple or branched
 - K1 Conidiophores mostly simple, seldom branched
 - L1 Parasitic, chiefly on grasses, conidia borne at apex or on side of conidiophore .. *Piricularia*, 94
 - L2 Saprophytic, or parasitic on nematodes
 - M1 Conidiophore bearing a single apical conidium *Dactylella*, 109
 - M2 Conidiophore bearing a cluster of radiate conidia at apex *Dactylaria*, 97
 - K2 Conidiophores distinctly branched
 - L1 Conidiophore terminating in penicillate branches
 - M1 Aquatic, on submerged vegetation; 1-celled tetrahedral, submerged conidia also present *Margaritispora*, 107
 - M2 Not aquatic; only long cylindrical conidia formed *Cylindrocladium*, 84
 - L2 Branches of conidiophore (phialides) verticillate *Dactylium*, 102
- G3 Conidia branched regularly or irregularly
 - H1 Conidiophores reduced, not evident *Thallospora*, 127
 - H2 Conidiophores distinct, length variable
 - I1 Conidial branches short, not greatly divergent
 - J1 Conidia with 2 or 3 prongs
 - K1 Conidia typically 2-pronged *Dicranidion*, 113
 - K2 Conidia typically 3-pronged *Tridentaria*, 122
 - J2 Conidial apparatus roughly globoid in shape
 - K1 Conidial branches enlarged, not anastomosing *Candelabrum*, 130
 - K2 Conidial branches slender, often anastomosing *Spirosphaera*, 132
Clathrosphaerina, 131
 - I2 Conidial branches widely divergent, slender
 - J1 Central body or cell of conidium much enlarged

- K1 Conidia inversely pyramidal, with short conical arms *Triposporina*, 126
- K2 Conidia pyriform or clavate, with three slender branches *Clavariopsis*, 120
- K3 Conidia with globose central cell, four or five slender branches *Actinospora*, 125
- J2 Conidia without greatly enlarged central cell
 - K1 Conidia produced on phialides (also see *Varicosporium* for first conidium)
 - L1 Conidium with elongated axis and two lateral branches arising side by side midway on axis *Alatospora*, 123
 - L2 Conidium with four divergent branches arising from near the base *Lemonniera*, 114
 - K2 Conidia not borne on true phialides
 - L1 Conidial branches formed in succession (one at a time)
 - M1 Branches 4 or more
 - N1 Branches 4, divergent, arising from different levels of main axis *Tetracladium*, 121
 - N2 Branches indefinite in number, principally from one side of main axis or its branches *Varicosporium*, 119
 - N3 Branches dendroid, not limited to one side *Dendrospora*, 128
 - M2 Branches usually 3 or less
 - N1 Branches arising from different levels *Tricladium*, 117
 - N2 Branches arising from base of central axis *Tricelophorus*, 134
 - L2 Conidial branches formed simultaneously
 - M1 Two branches arising about midway on slender axis *Tetrachaetum*, 129
 - M2 Branches arising near base from somewhat enlarged cells *Campylospora*, 115
 - M3 Branches arising near the apex of the spore axis
 - N1 Conidial axis long spindle-shaped, many-celled *Trinacrium*, 112
 - N2 Conidial axis filiform, few-celled *Articulospora*, 124
- D2 Conidiophores or (and) conidia containing dark pigment; conidiophores not united into sporodochia or synnemata (*Dematiaceae*)

- E1 Conidia one-celled, globose to short cylindrical
 - F1 Conidiophores absent, very short, or not distinct from mycelium
 - G1 Conidia in long chains
 - H1 Conidia separating easily; chains upright *Torula*, 146
 - H2 Conidia not separating easily; chains mostly horizontal *Hormiscium*, 147
 - G2 Conidia not in long chains
 - H1 Conidia yeast-like, borne on sides of mycelial cells *Pullularia*, 148
 - H2 Conidia not yeast-like, borne singly, smooth ... *Ellisiella*, 166
 - H3 Conidia not yeast-like, borne in small clusters, rough-walled *Echinobotryum*, 174
 - F2 Distinct conidiophores or phialides present
 - G1 Conidia endogenous
 - H1 Conidia hyaline or subhyaline
 - I1 Conidia frequently catenulate, rod-shaped
 - J1 Dark chlamydospores absent *Chalara*, 153
 - J2 Chlamydospores present, rounded, usually borne singly *Chalaropsis*, 155
 - J3 Chlamydospores present, forming an apical row of short, barrel-shaped cells *Thielaviopsis*, 159
 - I2 Conidia not catenulate, not rod-shaped
 - J1 Phialides arising from mycelial cells *Margarinomyces*, 158
 - J2 Conidiophores erect, simple slender
 - K1 Conidia often appearing in pairs at apex of conidiophore *Bisporomyces*, 156
 - K2 Conidia produced successively held in slime droplets *Catenularia*, 152
 - H2 Conidia with dark pigment, dark in mass
 - I1 Conidiophores simple, on extensive stroma *Cryptostroma*, 161
 - I2 Conidiophores simple or branched, not on stroma
 - J1 Conidia in long chains; dark, exogenous conidia also present *Hughesiella*, 154
 - J2 Conidia in small clusters, of one kind *Phialophora*, 151
 - G2 Conidia exogenous
 - H1 Conidia hyaline or subhyaline
 - I1 Conidiophores simple or sparingly branched; conidia not in mucilaginous clusters

- J1 Single short, fertile branch of conidiophore near base, bearing dark prophialide and subhyaline phialides *Zygosporium*, 150
- J2 Conidiophore, if branched, not as above
- K1 Conidia borne in apical clusters, heads or chains
- L1 Conidia in small clusters on slender conidiophores
- M1 Conidia attached at same level on a collar at apex of conidiophore *Menispora*, 183
- M2 Conidia produced successively on new growing tips *Idriella*, 160
- L2 Conidia in globose or clavate heads on enlarged apex of conidiophore *Basidiobotrys*, 180
- L3 Conidia catenulate, borne on flask-shaped phialides on upper portion of conidiophore . *Acrophialophora*, 187
- K2 Conidia single, or borne laterally as well as apically
- L1 Conidium with an apical appendage *Ellisiella*, 166
- L2 Conidium without appendage
- M1 Conidia apical, single or in short chains. *Monilochaetes*, 164
- M2 Conidia single, apical or lateral *Chloridium*, 178
- M3 Conidia in short chains, apical and lateral *Sympodiella*, 179
- I2 Conidiophores with numerous branches; conidia held in heads or clusters by mucilage
- J1 Branches only near apex, penicillate *Leptographium*, 195
- J2 Branches not confined to area near apex
- K1 Phialides borne directly on main conidiophore and on its branches *Stachylidium*, 198
- K2 Phialides secondary on short lateral branches *Gonytrichum*, 196
- K3 Spore-bearing branches secondary; conidia indistinctly 2-celled (keyed here for convenience) *Chaetopsis*, 199
- I3 Conidiophores usually branched, conidia in dry clusters..... *Botrytis*, 65
- H2 Conidia with distinct dark pigment
- I1 Conidia catenulate, in chains of several cells
- J1 Conidia variable, ovoid, ellipsoid to oblong, conidiophore branched (also see *Cladosporium*) *Hormodendrum*, 191
- J2 Conidia globose or nearly so; conidiophores simple or reduced to sporogenous cells

- K1 Conidia produced basipetally
 - L1 Conidiophore enlarged at apex which is covered with phialides *Aspergillus*, 74
 - L2 Sporogenous cells thick, at apex of conidiophore *Memnoniella*, 182
 - L3 Sporogenous cells slender *Phaeoscopulariopsis*, 162
- K2 Conidia produced acropetally
 - L1 Sterile hairs (setae) among conidiophores
 - M1 Apex of conidiophore not inflated *Lacellina*, 192
 - M2 Apex of conidiophore inflated *Lacellinopsis*, 193
 - L2 Sterile hairs (setae) absent *Torula*, 146
- I2 Conidia single, or less often in short chains of 2 or 3, or small heads
 - J1 Conidia top-shaped or spindle-shaped, sharply pointed at one or both ends
 - K1 Conidiophores simple or forked, separate from simple setae *Beltrania*, 189
 - K2 Conidiophores branched, borne as branches on seta-like main axis *Beltraniella*, 190
 - J2 Conidia acute at apex, not top- or spindle-shaped
 - K1 Conidial scars annular, apical *Spilocaea*, 203
 - K2 Conidial scars lateral *Fusicladium*, 204
 - J3 Conidia rounded or irregular, not sharp-pointed
 - K1 Conidia (or scars) both apical and lateral on conidiophore or its branches
 - L1 Conidia borne on short chains of special, globoid, sporogenous cells *Sadasivania*, 185
 - L2 Conidia borne in clusters on swollen cells of conidiophore *Gonatobotryum*, 173
 - L3 Conidiophores without swollen or special globoid sporogenous cells
 - M1 Conidiophores with thick black septa *Arthrinium*, 168
 - M2 Conidiophores without thick black septa
 - N1 Conidia symmetrical, mostly ovoid
 - O1 Conidiophore long, branches and sporogenous cells verticillate *Verticicladium*, 194
 - O2 Conidiophores tall, branched, wavy... *Streptothrix*, 188
 - O3 Conidiophores simple, not wavy *Acrotheca*, 186
 - N2 Conidia asymmetrical, more or less flattened on one side

- O1 Conidiophores arising in tufts from a stroma *Pseudocamptoum*, 163
- O2 Conidiophores single, not on stroma. . *Virgaria*, 176
- K2 Conidia in apical clusters
 - L1 Conidia borne on thickened sporogenous cells
 - M1 A single conidium on each sporogenous cell *Stachybotrys*, 181
 - M2 Several conidia on small teeth on each sporogenous cell *Acrostaphylus*, 177
 - L2 Conidia sessile or nearly so, on simple conidiophores
 - M1 Conidiophores tall, cells of conidiophore long *Periconia*, 170
 - M2 Conidiophores relatively short, cells of conidiophore short *Hormisciomyces*, 157
- K3 Conidia mostly produced singly at apex of conidiophore or its branches (sometimes a few lateral spores are also present)
 - L1 Conidiophores long, several times the length of conidia
 - M1 Conidiophores branched on upper portion *Periconiella*, 197
 - M2 Conidiophores simple
 - N1 Conidia held in small clusters by mucilage *Gliomastix*, 149
 - N2 Conidia dry *Monotospora*, 169
Acremoniella, 175
 - L2 Conidiophores shorter, seldom more than 3 or 4 times length of conidia
 - M1 Conidia lenticular, with subhyaline band
 - N1 Endoconidia also produced from special conidiophores *Hughesiella*, 154
 - N2 Conidia of one kind, exogenous *Papularia*, 165
 - M2 Conidia ovoid, slightly pointed at apex, truncate at base *Wardomyces*, 184
 - M3 Conidia globose, without light band
 - N1 At least some conidiophores branched. . *Humicola*, 171
 - N2 Conidiophores simple
 - O1 Conidia smooth, borne on flat hyaline vesicle *Nigrospora*, 167 .
 - O2 Conidia spiny, not on hyaline vesicle . *Zygodesmus*, 172
- E2 Conidia typically 2-celled (1-celled or 3-celled conidia frequently present)

F1 Conidia catenulate

- G1 Conidial chains unbranched; spore septa thick,
black *Bispora*, 210
- G2 Conidial chains frequently branched; septa
not thick
- H1 Conidia regular in shape, borne on special
sporogenous cells *Dwayamala*, 200
- H2 Conidia variable in shape, without special
sporogenous cells *Cladosporium*, 201

F2 Conidia not catenulate

- G1 Sterile upright hyphae (setae) present or
conidiophores with prominent sterile tips
- H1 Conidiophores simple, short; dark, pointed
setae present *Dwayaloma*, 214
- H2 Conidiophores simple, tall; long, flexuous
setae present *Paspalomycetes*, 205
- H3 Conidiophores branched, tall; apical portion
sterile *Chaetopsis*, 199
- G2 Conidiophores without sterile tips; setae absent
- H1 Conidiophores wavy, enlarged at base *Polythrincium*, 208
- H2 Conidiophores not wavy, not enlarged at base
- I1 Conidia borne in clusters, small heads, or
short chains
- J1 Conidia apical and lateral *Cladotrichum*, 212
- J2 Conidia attached around apex of conidiophore. *Cordana*, 211
- I2 Conidia borne singly at apex or sides of
conidiophore or its branches
- J1 Apical cell of conidium rounded
- K1 Conidia approximately equally 2-celled
- L1 Conidiophore long, several times length
of conidia
- M1 Conidiophores simple *Ramalia*, 216
- M2 Conidiophores radiately branched
near apex *Pseudobotrys*, 213
- L2 Conidiophores short, scarcely longer
than conidia
- M1 Conidia mostly smooth-walled; stroma
absent *Dicoccum*, 209
- M2 Conidia rough-walled; stroma present .. *Asperisporium*, 202
- K2 Conidia unequally 2- to 3-celled *Pollaccia*, 215
- J2 Apical cell of conidium narrower than
basal cell, pointed

- K1 Mycelium subcuticular in host; conidiophores on stroma-like base
 - L1 Conidiophores with annellate conidial scars *Spilocaea*, 203
 - L2 Conidiophores with lateral conidial scars *Fusicladium*, 204
- K2 Mycelium subepidermal in host; conidiophores in close clusters, not on stroma.... *Passalora*, 207
Scolecotrichum, 206
- E3 Conidia 3- to several-celled, with transverse septa only
 - F1 Conidia endogenous *Sporoschisma*, 244
 - F2 Conidia exogenous
 - G1 Conidia catenulate
 - H1 Conidiophores short, mostly simple
 - I1 Conidia connected by small "separating cells"; scolecospores absent *Bahusandhika*, 237
 - I2 Conidia not connected by "separating cells"; scolecospores present..... *Pseudotorula*, 251
 - H2 Conidiophores long, upper portion usually branched
 - I1 Conidia borne apically only
 - J1 Conidia curved, not strictly end to end *Fusariella*, 249
 - J2 Conidia straight, end to end in chains *Septonema*, 232
 - I2 Conidia (or scars) lateral as well as apical *Dendryphion*, 254
 - G2 Conidia not catenulate
 - H1 Conidiophores absent or nearly so
 - I1 Conidium pointed at apex *Hormisciella*, 236
 - I2 Conidium rounded at apex *Trichocladium*, 218
 - H2 Conidiophores repeatedly branched
 - I1 Branching dichotomous or nearly so, terminal branches lobed *Dichotomophthora*, 247
 - I2 Branching not dichotomous, ending in short stubby branches *Spondylocladiella*, 248
 - I3 Branching not dichotomous, ends of branches not enlarged *Dendryphiopsis*, 246
 - H3 Conidiophores simple or sparingly branched
 - I1 Conidia borne on special, globose, sporogenous cells *Dwayabeeja*, 252
 - I2 Conidia not borne on special sporogenous cells
 - J1 Conidia cylindrical to filamentous

- K1 Conidia cylindrical, sometimes with apical appendages *Camposporium*, 225
- K2 Conidia long, slender to filiform, tapering upward; conidiophores clustered (*Cercospora*, 242)
- K3 Conidia long, cylindrical; conidiophores short, single; hyphopodia present on natural substrate *Clasterosporium*, 245
- J2 Both phragmospores and scolecospores present *Dwayabeeja*, 252
- J3 Conidia all phragmosporous
 - K1 Conidium with apical appendage
 - L1 Apical appendage stout, curved or hooked. . *Ceratophorum*, 241
 - L2 Appendages filiform, not hooked
 - M1 Conidia clustered..... *Pleiochaeta*, 219
 - M2 Conidium single *Lomaantha*, 253
 - K2 Conidia without appendages
 - L1 Conidiophores clustered or arising from stroma
 - M1 Conidia broadly ellipsoid, rounded at apex
 - N1 Conidiophore frequently proliferating old conidium which is left as a cup-like structure *Endophragmia*, 222
 - N2 Cup-like structure absent; conidium apical, single *Stigmina*, 243
 - M2 Conidia pointed at apex, broader near base
 - N1 Conidiophores arising from stroma.... *Exosporium*, 234
 - N2 Conidiophores not on stroma..... *Prathigada*, 233
 - L2 Conidiophores single, not on stroma
 - M1 Conidiophores poorly differentiated, short
 - N1 Conidia long, nearly cylindrical, hyphopodia present on natural substrate *Clasterosporium*, 245
 - N2 Conidia short, ovoid, ellipsoid or clavate *Trichocladium*, 218
 - M2 Conidiophores well developed, but sometimes short
 - N1 Conidia apical, produced singly, or successively
 - O1 Conidium single, large, on slender, simple, subhyaline conidiophore *Blodgettia*, 235
 - O2 Conidium single, on dark conidiophore
 - P1 Conidiophore simple *Sporidesmium*, 250
 - P2 Conidiophore with few branches near the apex *Edmundmasonia*, 238

- O3 Conidia typically produced successively on dark conidiophores
 - P1 Conidiophore sometimes proliferating previous conidium with its base attached as a cup *Endophragmia*, 222
Phragmocephala, 221
 - P2 Conidiophores showing annular conidial scars near apex
 - Q1 Conidiophores arising from host cells *Deightoniella*, 217
 - Q2 Conidiophores arising from superficial mycelium on leaves *Annellophora*, 240
- N2 Conidia produced in groups or clusters at or near apex of conidiophore
 - O1 Conidia on cup-like structures, leaving circular scars *Hansfordiella*, 227
 - O2 Conidia not on cup-like structures
 - P1 Conidiophores tall, not inflated
 - Q1 Conidia ovoid, broader at apex, borne on slender, bent, separating cells *Brachysporium*, 229
 - Q2 Conidia oblong to fusoid, often slightly curved, not on separating cells.... *Cacumisporium*, 224
 - P2 Conidiophores short, inflated..... *Cephaliophora*, 220
- N3 Attachment of conidia (or conidial scars) lateral as well as apical
 - O1 Conidia in whorls on upper cells of conidiophores..... *Spondylocladium*, 223
 - O2 Conidia not in whorls
 - P1 Conidia ellipsoid to cylindrical, straight or slightly curved, smooth.. *Helminthosporium*, 228
 - P2 Conidia bent, with 1 or 2 central cells enlarged, smooth *Curvularia*, 230
 - P3 Conidia cylindrical, echinulate or verrucose *Heterosporium*, 231
- E4 Conidia several-celled, muriform, dictyosporous; or 4-celled and cross-shaped
 - F1 Conidia catenulate
 - G1 Conidia similar to segments of conidiophore; conidiophores clustered *Sirodesmium*, 262
 - G2 Conidia unlike conidiophore, attenuated at apex .. *Alternaria*, 266
 - G3 Conidia unlike conidiophore, rounded *Fumago*, 264
 - F2 Conidia not catenulate
 - G1 Conidium with large, swollen, apical cell *Acrospeira*, 255

- G2 Apical cell of conidium not distinctly larger than others
- H1 Conidiophores well developed, usually longer than conidia
- I1 Conidia single, apical
- J1 Conidia attenuated at apex *Alternaria*, 266
- J2 Conidia globose to broadly ellipsoid, not attenuated *Stemphylium*, 268
- I2 Conidia in apical clusters *Dactylosporium*, 267
- I3 Conidia borne laterally on conidiophore
- J1 Conidiophores with thick, dark septa; conidia regularly 4-celled *Dictyoarthrinium*, 256
- J2 Septa of conidiophores not thick, dark; conidial cells variable *Trichaegum*, 261
- H2 Conidiophores none or poorly developed, shorter than conidia
- I1 Conidiophores indefinite or none; conidium 4-celled *Tetracoccosporium*, 25
- I2 Conidiophores arising from stroma-like mass of hyphae *Berkleasium*, 263
- I3 Conidiophores present, not arising from mass of hyphae
- J1 Conidia fusoid with tapering ends *Dictyodesmium*, 259
- J2 Both rounded muriform spores and subhyaline falcate conidia present *Sarcinella*, 265
- J3 Only dark, rounded, muriform conidia produced
- K1 Conidiophores clustered *Epicoccum*, 316
- K2 Conidiophores single
- L1 Saprophytic, mostly on wood *Coniothecium*, 258
- L2 Parasitic, principally on leaves *Piricauda*, 260
- E5 Conidia distinctly lobed or branched (staurosporous)
- F1 Conidia somewhat disc-shaped, dichotomously lobed, without distinct branches *Desmidiospora*, 270
- F2 Conidia typically with 2 or more distinct branches
- G1 Branches of conidium upright, parallel or slightly divergent
- H1 Spore branches connected *Dictyosporium*, 278
- H2 Spore branches separate
- I1 Conidia borne successively at apex of conidiophore; branches parallel *Ceratosporella*, 279
- I2 Conidia single, with 3-5 somewhat divergent branches *Speiropsis*, 271

- I3 Conidia single, usually with several compact branches *Speira*, 280
- G2 Conidial branches upright or lateral, divergent
- H1 Conidiophores absent or reduced to short pegs
- I1 Conidium with a large, black, globose central cell and 3 or 4 radiating appendages *Orbiomyces*, 272
- I2 Conidium without large, black, central cell
- J1 Conidium consisting of 2 or 3 straight or curved upright arms
- K1 Parasitic on leaves *Hirudinaria*, 275
- K2 Saprophytic, mostly on wood *Ceratosporium*, 276
- J2 Conidium cruciform, 4-armed *Hormiskyopsis*, 281
- J3 Conidium consisting of 3 or 4 enlarged basal cells which became attenuated upward *Tetraploa*, 277
- H2 Conidiophores present, definite, variable in length
- I1 Conidium with 3 arms, Y-shaped or triangular
- J1 Conidiophore attached to basal, central cell.. *Triposporium*, 269
- J2 Conidiophore attached to base of Y-shaped conidium
- K1 Conidial scars annular near apex of conidiophore *Iyengarina*, 273
- K2 Conidial scars lateral *Diplocladiella*, 274
- I2 Conidium typically with 5 or more radiating arms
- J1 Some arms of conidium becoming long-attenuated *Megaster*, 284
- J2 Conidial arms not greatly attenuated
- K1 Conidial arms mostly 5 *Pentasporium*, 283
- K2 Conidial arms mostly 6 *Heptaster*, 282
- D3 Conidiophores united into sporodochia or synnemata
- E1 Conidia produced on sporodochia (*Tuberculariaceae*) (Sporodochia are frequently not produced in culture; frequently species classed as Melanconiales produce sporodochia in culture)
- F1 Conidia one-celled
- G1 Conidia hyaline or brightly colored
- H1 Sporodochia stroma-like, spreading, on developing grain *Sphacelia*, 293
- H2 Sporodochia not spreading, cushion-shaped, discoid or tuberculate, not on grain
- I1 Sporodochia with prominent setae or sterile hairs
- J1 Conidia with filiform or membranous appendages

- K1 Appendage apical, single, membranous, obconical *Lomachashaka*, 298
- K2 Appendages slender, one at each end of conidium
 - L1 Conidia in gelatinous mass; sporodochia pyriform *Neottiosporella*, 296
 - L2 Conidia not in gelatinous mass; sporodochia cushion-shaped *Thozetellopsis*, 302
- J2 Conidia without appendages
 - K1 Setae (sterile hyphae) hyaline
 - L1 Conidia colorless in mass *Volutina*, 294
 - L2 Conidia greenish in mass *Myrothecium*, 290
 - K2 Setae (sterile hyphae) dark
 - L1 Setae wavy or coiled above, with blunt apex *Kutilakesa*, 289
 - L2 Setae straight or slightly curved, pointed
 - M1 Conidiophore segmenting into chain of 1-celled conidia *Setodochium*, 300
 - M2 Conidia not in chains
 - N1 Sporodochia discoid *Volutella*, 301
 - N2 Sporodochia subglobose, with narrow base *Schizotrichella*, 295
- I2 Sporodochia without prominent setae or sterile hairs
 - J1 Sporodochia normally bursting out of living leaves
 - K1 Parasitic on rusts; conidia globose or nearly so *Tuberculina*, 292
 - K2 Not parasitic on rusts; conidia oblong, hyaline *Microstroma*, 307
(This genus is frequently classified elsewhere)
 - K3 Not parasitic on rusts; conidia ellipsoid, dark, several-celled *Stigmina*, 243
 - J2 Sporodochia mostly superficial
 - K1 Conidial mass gelatinous *Illosporium*, 287
 - K2 Conidial mass dry or nearly so
 - L1 Conidia with membranous appendages
 - M1 Conidium with single apical appendage .. *Starkeyomyces*, 297
 - M2 Conidium with one appendage at each end *Koorchalomella*, 299
 - L2 Conidia without appendages

- M1 Conidia catenulate or held together in pillar-like masses
 - N1 Conidia greenish in mass..... *Myrothecium*, 290
Metarrhizium, 71
 - N2 Conidia colorless or yellowish in mass
 - O1 Central portion of sporodochium made up of closely packed tissue; conidia small *Nalanthamala*, 286
 - O2 Central portion of sporodochium made up of conidiophores; conidia large.... *Sphaerosporium*, 303
- M2 Conidia not catenulate
 - N1 Sporodochia cushion-shaped, hemi-spherical to subglobose
 - O1 Conidiophores verticillately branched *Dendrodochium*, 291
 - O2 Conidiophores irregularly branched .. *Tubercularia*, 285
 - N2 Sporodochia discoid, flattened *Hymenula*, 288
- G2 Conidia with dark pigment
 - H1 Sporodochia globose, superficial on stroma *Aegerita*, 308
 - H2 Sporodochia cushion-shaped or flattened, not on stroma
 - I1 Sporodochia erumpent from leaves
 (Also placed in *Dematiaceae*) *Hadrotrichum*, 311
 - I2 Sporodochia superficial on bark or wood..... *Strumella*, 312
- F2 Conidia 2-celled
 - G1 Conidia hyaline; setae present on sporodochium .. *Kutilakesopsis*, 304
 - G2 Conidia dark; setae absent *Pucciniopsis*, 310
- F3 At least some conidia more than 2-celled, hyaline or dark
 - G1 Conidia hyaline or brightly colored
 - H1 Conidia very large, cylindrical to ellipsoid, yellow in mass *Bactridium*, 309
 - H2 Conidia long, slender, colorless in mass
 - I1 Sporodochia with dark setae..... *Wiesneriomyces*, 305
 - I2 Sporodochia without setae
 - J1 Macroconidia canoe-shaped (many microconidia may also be present) *Fusarium*, 100 }
 - J2 Conidia long-slender, curved, with short side branches *Ramulispora*, 306
- G2 Conidia dark
 - H1 Conidia branched or lobed

- I1 Conidium with short, compact, upright branches on short conidiophore *Cheiromyces*, 318
- I2 Conidium 4-lobed, on long slender conidiophore *Spegazzinia*, 317
- H2 Conidia not branched or lobed
 - I2 Septa of conidia irregular in position
 - J1 Conidia mostly globose; mostly saprophytic .. *Epicoccum*, 316
 - J2 Conidia pyriform or irregular; on heads of grasses *Cerebella*, 313
 - J3 Conidia large, broad-cylindrical; saprophytic *Berkleasium*, 263
 - I2 Conidia with transverse septa only
 - J1 Sporodochia with dark setae *Excipularia*, 315
 - J2 Sporodochia without setae
 - K1 Conidiophores arising from special enlarged cells; parasitic, on leaves *Camptomeris*, 314
 - K2 Conidiophores not arising from special enlarged cells; saprophytic
 - L1 Conidia apical, single *Bactrodesmium*, 226
 - L2 Conidia apical, produced successively, often in short chains *Bactrodesmiella*, 239
- E2 Conidiophores united into synnemata (Stilbellaceae)
 - F1 Not parasitic on insects or spiders
 - G1 Both conidiophores and conidia hyaline, subhyaline, or bright-colored
 - H1 Conidia in terminal heads
 - I1 Head with setae or sterile hairs
 - J1 Conidia borne on phialides on branched conidiophores *Heterocephalum*, 326
 - J2 Conidia borne apically and laterally on conidiophore; phialides absent *Actinoceps*, 321
 - I2 Setae or sterile hairs absent
 - J1 Conidial heads gelatinous or conidia in mucilage
 - K1 Conidia 1-celled *Stilbum*, 320
 - K2 Conidia typically 2-celled *Didymostilbe*, 336
 - J2 Conidia not in gelatinous material or mucilage *Martindalia*, 327
 - H2 Conidia not confined to terminal heads
 - I1 Conidia 1-celled *Isaria*, 319
 - I2 Conidia mostly 4-celled *Atractium*, 335

G2 Conidiophores or conidia, or both, dark

H1 Conidia 1-celled

I1 Conidia confined to terminal area in more or less definite heads

J1 Conidia hyaline, conidiophores dark

K1 Conidia endogenous, not in mucilage..... *Endosporostilbe*, 331K2 Conidia exogenous, in droplets of mucilage *Graphium*, 323

J2 Conidia with dark pigment

K1 Synnema expanding upward into a funnel which is filled with conidia *Endocalyx*, 330

K2 Synnema not funnel-shaped

L1 Conidia borne singly on cup-like structures on apex and side of conidiophore.... *Paathramaya*, 329

L2 Conidia catenulate, apical on conidiophore

M1 Synnema stalk dark *Sporocybe*, 325M2 Synnema stalk hyaline..... *Anthromycopsis*, 328

I2 Conidial area longer, not confined to terminal heads

J1 Conidia catenulate

K1 Conspicuous sterile spines among conidiophores..... *Trichurus*, 346K2 Sterile spines absent..... *Stysanus*, 324

J2 Conidia not catenulate

K1 Conidium with a short apical appendage at each end..... *Menisporopsis*, 332

K2 Conidia without appendages

L1 Conidia pointed, curved..... *Harpographium*, 333L2 Conidia globose *Tharoopama*, 322

H2 Conidia 2- to several-celled

I1 Conidia with transverse and oblique septa (dictyosporous) *Sclerographium*, 342I2 Conidia with transverse septa only, long, slender (scolecosporous) *Prathoda*, 341

I3 Conidia shorter, with transverse septa only (didymosporous on phragmosporous)

J1 Conidia catenulate *Dendrographium*, 338

J2 Conidia not catenulate

K1 Conidia (conidial scars) lateral as well as apical; conidiophores in rather loose clusters *Isariopsis*, 339

- K2 Conidia apical only; conidiophores compact
 - L1 Conidia limited to apical head
 - M1 Conidia 2-celled, dry..... *Didymobotryum*, 334
 - M2 Conidia 3-4-celled, in slime droplets..... *Arthrobotryum*, 340
 - L2 Fertile portion of synnema long, not head-like *Podosporium*, 337
- F2 Parasitic on insects or spiders
 - G1 Phialides composing globose or wedge-shaped heads..... *Gibellula*, 343
 - G2 Phialides not in heads
 - H1 Phialides rather short, composing a compact layer
 - I1 Synnemata cylindrical; phialides obtuse at apex; conidia single *Hymenostilbe*, 347
 - I2 Synnemata clavate; phialides pointed; conidia catenulate..... *Insecticola*, 348
 - I3 Synnemata cylindrical to attenuated upward; phialides pointed; conidia catenulate *Akanthomyces*, 349
 - H2 Phialides not in compact layer
 - I1 Phialides not elongated, spores dry..... *Isaria*, 319
 - I2 Phialides elongated, slender; conidia covered with mucous
 - J1 Phialides enlarged at base; conidia not in heads *Hirsutella*, 344
 - J2 Phialides not enlarged at base; conidia held in heads..... *Synnematium*, 345
- B2 Conidiophores and conidia produced within pycnidia..... (SPHAEROPSIDALES)
 - C1 Conidia globose to oblong or ellipsoid, not filiform
 - D1 Conidia 1-celled
 - E1 Conidia hyaline
 - F1 Pycnidia complete, or with well developed base
 - G1 Pycnidia separate, not in stroma
 - H1 Pycnidia with long neck or beak; not parasitic on powdery mildews
 - I1 Pycnidia dark *Sphaeronema*, 365
 - I2 Pycnidia hyaline or light-colored
 - J1 Wall of pycnidium and neck composed of long, parallel hyphae *Hyalopycnis*, 366
 - J2 Pycnidial wall composed of short, angled pseudoparenchymetous cells *Eleutheromyces*, 367
 - H2 Pycnidia mostly ovoid; parasitic on powdery mildews *Ampelomyces*, 371

- H3 Pycnidial beak short or lacking; not parasitic on powdery mildews
- I1 Pycnidia breaking open irregularly, without a pore
- J1 Pycnidia with dark setae
- K1 Conidium with an apical, slender appendage at each end *Dinemasporium*, 385
- K2 Conidium without appendage *Amerosporium*, 381
- J2 Pycnidia without dark setae
- K1 Pycnidia superficial
- L1 Pycnidia soft, leathery, subglobose not on subiculum *Catinula*, 380
- L2 Pycnidia hard, irregular, on subiculum... *Chaetophoma*, 362
- K2 Pycnidia, at least partially, within substratum, breaking out
- L1 Pycnidia large, resembling sclerotia; conidia ellipsoid, pointed *Sclerotiopsis*, 370
- L2 Pycnidia not resembling sclerotia; conidia ovoid to ellipsoid
- M1 Pycnidia fleshy, bright-colored when fresh *Hainesia*, 389
- M2 Pycnidia hard, dark
- N1 Pycnidia subcortical, on woody twigs .. *Dothichiza*, 384
- N2 Pycnidia subepidermal, on fleshy tissue leaves
- O1 Pycnidia discoid, dehiscing radiately . *Sporonema*, 379
- O2 Pycnidia globose, opening at apex *Plenodomus*, 354
- I2 Pycnidium with definite ostiole or pore
- J1 Pycnidia on subiculum of radiating hyphae *Asteromella*, 361
- J2 Pycnidia not on subiculum
- K1 Conidia of 2 kinds, short and ovoid, long and curved or bent *Phomopsis*, 360
- K2 Conidia of one type
- L1 Conidia endogenous *Phialophoraphoma*, 352
- L2 Conidia exogenous
- M1 Conidia curved, typically lunate *Selenophoma*, 357
- M2 Conidia ovoid; dark dictyosporous chlamydospores present *Peyronelleae*, 358
- M3 Conidia globose, ovoid, or ellipsoid, straight or slightly curved; without dark dictyosporous chlamydospores

- N1 Conidiophores branched
 - O1 Conidium with an apical appendage ... *Eleutheromycella*, 364
 - O2 Conidium without appendages *Dendrophoma*, 356
- N2 Conidiophores simple
 - O1 Conidium with hyaline, membranous appendage
 - P1 Appendage apical, obconical *Neottiospora*, 368
 - P2 Appendage slender, turned back along spore *Anthasthoopta*, 386
 - O2 Conidia without appendages
 - P1 Pycnidia superficial on natural substrate
 - Q1 Pycnidium tapering below into a short stalk *Rhizosphaera*, 359
 - Q2 Pycnidia not tapering below *Aposphaeria*, 353
 - P2 Pycnidia imbedded in natural substrate
 - Q1 Conidia longer than 15 microns ... *Macrophoma*, 363
 - Q2 Conidia shorter
 - R1 Setae present on pycnidium *Pyrenochaeta*, 355
 - R2 Pycnidia without setae *Phoma*, 351
- Phyllosticta*, 350
- G2 Pycnidia in stroma, frequently evident only by pycnidial cavities
 - H1 Conidium with one or more apical appendages
 - I1 Conidium with single, long, unbranched, apical appendage *Petrakomyces*, 382
 - I2 Conidium with an apical and a basal unbranched appendage *Shanoria*, 383
 - I3 Conidium with a short branched appendage at each end *Dilophospora*, 373
 - H2 Conidia without appendages
 - I1 Stromata superficial or subcuticular
 - J1 Stroma soft, brightly colored *Aschersonia*, 390
 - J2 Stroma dark unilocular; conidia borne singly *Schizothyra*, 387
 - J3 Stroma dark with several locules; conidia catenulate *Creothyriella*, 388
 - I2 Stromata subepidermal or subcortical
 - J1 Conidia fusoid, ends rather pointed *Fusicoccum*, 375
 - J2 Conidia not fusoid, ends rounded

- K1 Conidiophores filiform, septate
 - L1 Conidia borne apically only..... *Rabenhorstia*, 376
 - L2 Conidia lateral as well as apical *Pleurostromella*, 374
- K2 Conidia short, seldom septate
 - L1 Conidia ovoid to broadly ellipsoid;
pycnidial cavities globose *Dothiorella*, 372
 - L2 Conidia narrow, ovoid to filiform;
pycnidial cavities irregular
 - M1 Conidia mostly filiform, bent or
curved *Cytosporina*, 369
 - M2 Conidia short, curved..... *Cytospora*, 377
 - M3 Conidia short, straight..... *Cytosporella*, 378
- F2 Pycnidia not complete, with only the upper
portion well developed
 - G1 Pycnidia shield-shaped, with or without ostiole
 - H1 Pycnidium held on a short stalk or column *Actinopelte*, 391
 - H2 Pycnidium without stalk or column *Leptothyrium*, 393
 - G2 Pycnidia flat, opening wide at maturity
 - H1 Stroma present..... *Melasmia*, 392
 - H2 Stroma absent *Leptostroma*, 394
- E2 Conidia with dark pigment
 - F1 Pycnidia incomplete, either upper or lower half
poorly developed *Piggotia*, 402
 - F2 Pycnidia complete, well developed, with or
without ostiole
 - G1 Parasitic on lichens *Lichenoconium*, 404
 - G2 Not parasitic on lichens
 - H1 Pycnidia with prominent dark bristles *Chaetomella*, 397
 - H2 Pycnidia without bristles
 - I1 Pycnidia light; conidiophores long; filiform *Harknessia*, 396
 - I2 Pycnidia dark; conidiophores short
 - J1 Pycnidia within a stroma
 - K1 Stroma imbedded in bark or wood *Haplosporella*, 400
 - K2 Stroma subcuticular *Protostroma*, 399
 - J2 Pycnidia not in stroma
 - K1 Conidia large, oval to elongate..... *Sphaeropsis*, 398
 - K2 Conidia small, globose to ovoid; without
dark chlamydospores..... *Coniothyrium*, 395
 - K3 Conidia small, ovoid; dark, several-
celled chlamydospores present..... *Peyronellaea*, 358

D2 Conidia two-celled

E1 Conidia hyaline

F1 Pycnidia in rust pustules; parasitic on rusts *Darluca*, 403

F2 Not parasitic on rusts

G1 Conidia without appendages

H1 Conidia equally two-celled

I1 Pycnidia in necrotic spots *Ascochyta*, 405

I2 Pycnidia not in necrotic spots

J1 Pycnidium with a distinct beak *Rhynchophoma*, 401J2 Pycnidium without distinct beak *Diplodia*, 406H2 Conidia unequally two-celled *Apiocarpella*, 412

G2 Conidia with appendages

H1 Conidium with an apical, awl-shaped, unbranched appendage *Kellermannia*, 409H2 Conidium with a single, branched, apical appendage *Vasudevella*, 407H3 Conidium with 3 or 4 hyaline appendages at one end *Robillarda*, 408

E2 Conidia dark

F1 Pycnidia separate, not in stroma *Diplodia*, 410F2 Pycnidia clustered, in a stroma *Botryodiplodia*, 411

D3 Conidia 3- to several-celled

E1 Conidia with transverse septa only

F1 Conidia without appendages

G1 Pycnidia brown or black, without stroma

H1 Conidia dark; pycnidia without spines

I1 Conidia single on conidiophores *Hendersonia*, 422I2 Conidia radiating in small group at apex of conidiophore *Prosthemia*, 424H2 Conidia hyaline; pycnidia without spines *Stagonospora*, 414H3 Conidia hyaline; pycnidia with dark spines near the ostiole *Aristatoma*, 415G2 Pycnidia bright-colored, with cushion-like stroma *Aschersonia*, 390

G3 Pycnidia dark, in stromata

H1 Conidia dark *Hendersonula*, 419

H2 Conidia hyaline

I1 Pycnidia subcuticular; conidia fusoid *Catinopeltis*, 418I2 Pycnidia subepidermal; conidia long cylindrical *Dothistroma*, 421

- F2 Conidia with apical appendages
- G1 Pycnidia cupulate or discoid; conidia with a single apical appendage *Heteropatella*, 416
- G2 Pycnidia globose; conidia with 3 or 4 apical appendages *Bartilinia*, 420
- G3 Pycnidia flattened; with 1 or 2 appendages
- H1 Conidium with 1 apical and 1 lateral appendage *Ciliochorella*, 413
- H2 Conidium with 1 apical appendage on each end .. *Discosia*, 417
- E2 Conidia muriform or star-shaped
- F1 Conidia muriform, globose to ellipsoid
- G1 Pycnidia not in stroma *Camarosporium*, 437
- G2 Pycnidia within a stroma *Dichomera*, 438
- F2 Conidia star-shaped, septate
- G1 Conidium typically with 4 equal radiating arms... *Asterosporium*, 459
- G2 Conidium with 3 to 5 unequal arms..... *Prosthemia*, 424
- C2 Conidia filiform, at least several times longer than wide, 1- to several-celled (scolecosporous)
- D1 Pycnidia in dark, hard stroma
- E1 Conidia 1-celled, bent or curved *Cytosporina*, 369
- E2 Conidia several-celled, long-cylindrical, straight .. *Dothistroma*, 421
- D2 Pycnidia not in stroma, not gelatinous
- E1 Pycnidia clavate or with a long beak
- F1 Conidia filiform-fusoid, hyaline, 1- or 2-celled ... *Sphaerographium*, 425
- F2 Conidia several-celled, pigmented *Cornularia*, 435
- E2 Pycnidia globose or flattened
- F1 Pycnidia ostiolate
- G1 Conidia hyaline
- H1 Pycnidia produced in necrotic spots on host
- I1 Pycnidia with setae near ostiole *Chaetoseptoria*, 431
- I2 Pycnidia without setae..... *Septoria*, 427
- H2 Pycnidia not in necrotic spots *Rhabdospora*, 430
- G2 Conidia pigmented, yellow to light brown *Phaeoseptoria*, 434
- F2 Pycnidia opening by wide mouth or slit
- G1 Conidia several-celled
- H1 Conidia breaking up into 1- to few-celled segments
- I1 Pycnidia dark, without setae *Schizothyrella*, 439
- I2 Pycnidia light-colored, with hyaline, pointed setae *Merismella*, 440

- H2 Conidia not segmenting
- I1 Pycnidia globose or cupulate, opening by a wide mouth *Phleospora*, 426
- I2 Pycnidia flattened, irregular, opening by a slit
- J1 Conidia borne singly on very short conidiophores *Leptostromella*, 433
- J2 Conidia several per conidiophore *Bisbyopeltis*, 441
- G2 Conidia not septate, bent or curved *Phlyctaena*, 423
- D2 Pycnidia gelatinous or with gelatinous stroma
- E1 Stroma smut-like in appearance, on grass; conidia nonseptate *Ephelis*, 432
- E2 Stroma otherwise, on bark or wood; conidia septate
- F1 Stroma elongate, stalked *Chondropodium*, 436
- F2 Stroma not elongate *Micropera*, 428
Gelatinosporium, 429
- B3 Conidiophores and conidia produced in acervuli on natural substrate (such fungi frequently produce sporodochium-like structures in artificial culture) (MELANCONIALES)
- C1 Conidia 1-celled, short, not filiform
- D1 Conidia hyaline
- E1 Conidia produced laterally on cells of conidiophore *Catenophora*, 445
- E2 Conidia produced apically
- F1 Conidia with apical, hyaline branched appendages.. *Pestalotziella*, 446
- F2 Conidia without appendages
- G1 Dark spines (setae) present in acervulus *Colletotrichum*, 443
- G2 Acervuli without dark spines
- H1 Conidiophores arising from a stroma-like base . *Sphaceloma*, 442
- H2 Stroma-like base absent..... *Gloeosporium*, 444
- D2 Conidia dark *Melanconium*, 447
- C2 Conidia 2- to several-celled, with transverse septa only, not filiform
- D1 Conidia 2-celled
- E1 Conidium unequally 2-celled, without appendages.... *Marssonina*, 449
- E2 Conidium equally 2-celled, with a single appendage at each end *Leptodiscus*, 448
- D2 Conidia 3- to several-celled
- E1 Conidia hyaline..... *Septogloeum*, 450
- E2 Conidia dark
- F1 Conidia with appendages, end cells hyaline

- G1 With a single beak-like appendage at apex of conidia *Monochaetia*, 454
- G2 With 2 or 3 apical appendages at apex of conidia.. *Pestalotia*, 455
- F2 Conidia without appendages, all cells dark *Coryneum*, 456
- C3 Conidia filiform, 1- to several-celled
 - D1 Parasitic on leaves
 - E1 Conidia becoming septate *Cylindrosporium*, 453
 - E2 Conidia remaining 1-celled *Cryptosporium*, 451
 - D2 Saprophytic on wood or bark *Libertella*, 452
- C4 Conidia muriform, cross-shaped or star-shaped
 - D1 Conidia dark, star-shaped *Asterosporium*, 459
 - D2 Conidia dark, muriform *Steganosporium*, 458
 - D3 Conidia hyaline, appendaged, cross-shaped..... *Entomosporium*, 457
- B4 Conidia not known to be produced (MYCELIA STERILIA)
 - C1 Sclerotia variable in form, irregular, usually formed of loosely woven hyphae..... *Rhizoctonia*, 460
 - C2 Sclerotia large, globose to irregular; hyphae compact . *Sclerotium*, 461 ✓
 - C3 Bulbils or small clusters of compact cells present..... *Papulaspora*, 462 ✓

DESCRIPTIONS
and
ILLUSTRATIONS

CONIDIAL PHYCOMYCETES

1. HAPLOSPORANGIUM Thaxt. Mycelium slender, giving rise to tapering conidiophores (sporangiophores), each bearing a conidium (1- or 2-spored sporangiole); conidia more or less globose; at 37° C. conidia are reported to enlarge to form chlamydospores; saprophytic, or pathogenic on animals. Carmichael (44) believes that this genus does not belong in the Phycomycetes.

Fig. 1. A, B, *H. parvum*, redrawn from Carmichael (44); C, D, *H. bisporale*, redrawn from Thaxter (281). Other references (119, 110).

2. STYLOPAGE Drechsler. Mycelium, slender, non-septate, sparsely branched; conidia hyaline, borne singly or successively on erect simple conidiophores; occurring on decaying plant materials and capturing and consuming amoebae or small nematodes.

Fig. 2. *S. lepte*; redrawn from Drechsler (77).

3. ZOOPAGE Drechsler. Mycelium sparse, slender, sparingly branched, non-septate; conidia hyaline, elongated, single or catenulate; occurring in leaf mold and subsisting on amoebae.

Fig. 3. *Z. mitospora*; redrawn from Drechsler (81).

4. ACAULOPAGE Drechsler. Mycelium slender, non-septate, sparsely branched; conidia aerial, hyaline, borne singly on prostrate hyphae; occurring in soil on decaying plant materials and capturing and consuming amoebae.

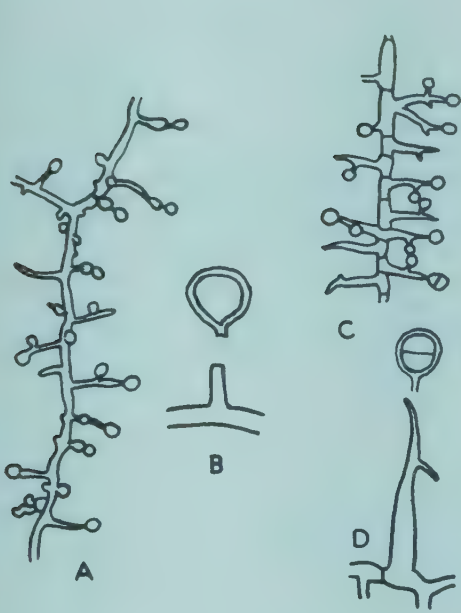
Fig. 4. A, *A. macrospora*; B, *A. tetraceros*; redrawn from Drechsler (77).

5. BDELLOSPORA Drechsler. Aerial hyphae slender, non-septate; haustoria short, branched; conidia 1-celled, hyaline, elongate, catenulate; occurring on decaying roots and parasitic on amoebae; similar to *Cochlonema* except in form of haustorium.

Fig. 5. *B. helicoides*; redrawn from Drechsler (76).

6. COCHLONEMA Drechsler. Aerial mycelium slender, haustoria coiled, conidia 1-celled, hyaline, catenulate; probably occurring on decaying plant material and destructive to amoebae (compare with *Bdellospora*).

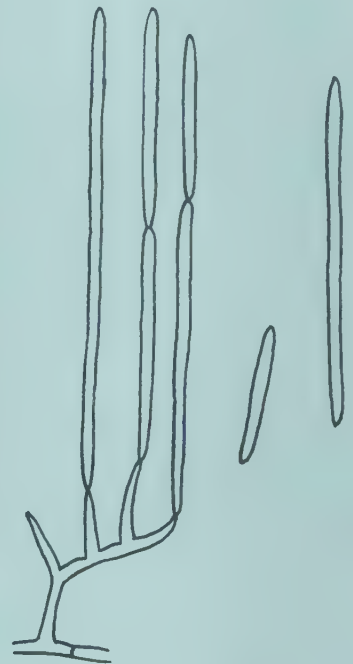
Fig. 6. *C. verrucosm*; redrawn from Drechsler (76).



1. Haplosporangium



2. Stylopage



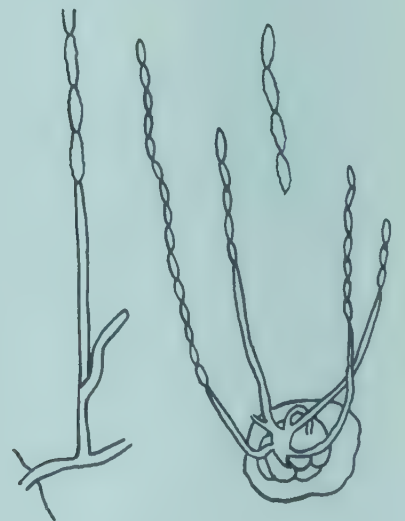
3. Zoopage



4. Acaulopage



5. Bdellospora



6. Cochlonema

7. *HELICOCEPHALUM* Thaxt. Conidiophores upright, long, slender, simple, non-septate; conidia produced in a spiral, forming a head held in a slime drop, 1-celled, ellipsoid, hyaline or slightly pigmented; saprophytic on dung or decaying wood.

Fig. 7. A, *H. sarcophilum*; redrawn from Thaxter (277); B, *H. oligosporum*, original, from material on decayed wood. Other reference (75).

8. *RHOPALOMYCES* Corda. Mycelium sparse; conidiophores upright, slender, simple; conidia borne on enlarged tip of conidiophore which is hexagonally aerolate, 1-celled, hyaline, ellipsoid; saprophytic on plant material.

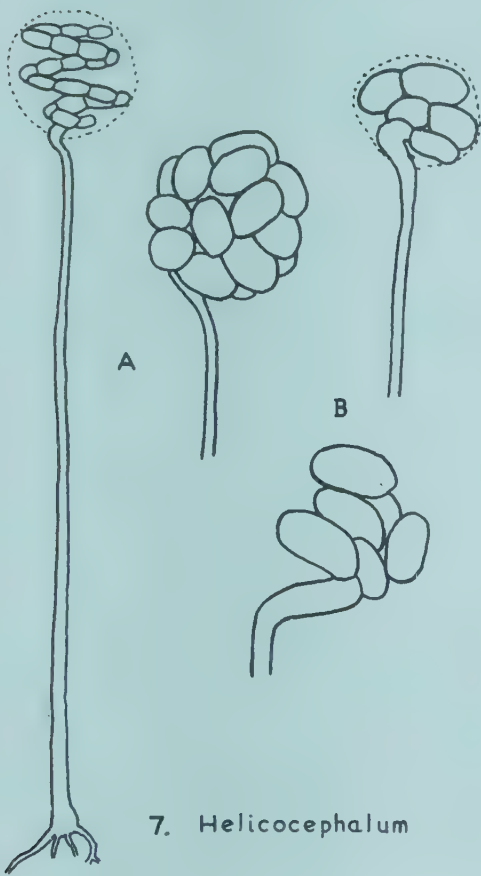
Fig. 8. A, *R. elegans*; fruiting head, redrawn from Boedijn (33); B, C, *R. strangulatus*, redrawn from Thaxter (276).

9. *CUNNINGHAMELLA* Matr. Mycelium white, extensive in culture, non-septate, conidiophores (sporangiophores) simple or branched, with enlarged tips bearing heads of conidia (sporangioles); conidia hyaline, 1-celled, globose; common saprophytes in soil.

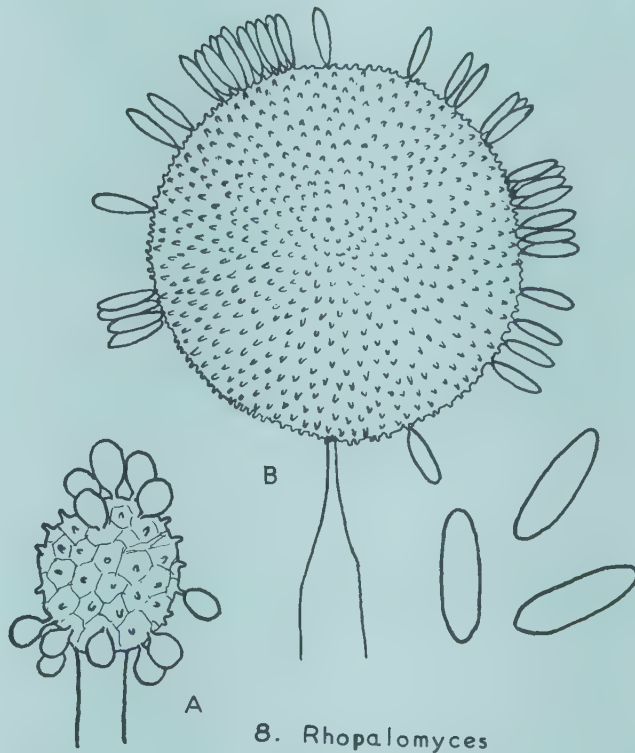
Fig. 9. *C. elegans*; original, from pure culture. A, simple conidiophore and head of conidia; B, branched conidiophore; C, detail of tip of conidiophore showing sterigmata; D, conidia. References (60, 120).

10. *MYCOTYPHA* Fenner. Mycelium at first non-septate, later becoming septate, hyaline; conidiophores (sporangiophores) erect, tall, simple, septate; head of spores cylindrical; conidia (sporangioles) 1-celled, borne singly on short sterigmata; saprophytic.

Fig. 10. *M. microspora*; original, from culture. Reference (97).



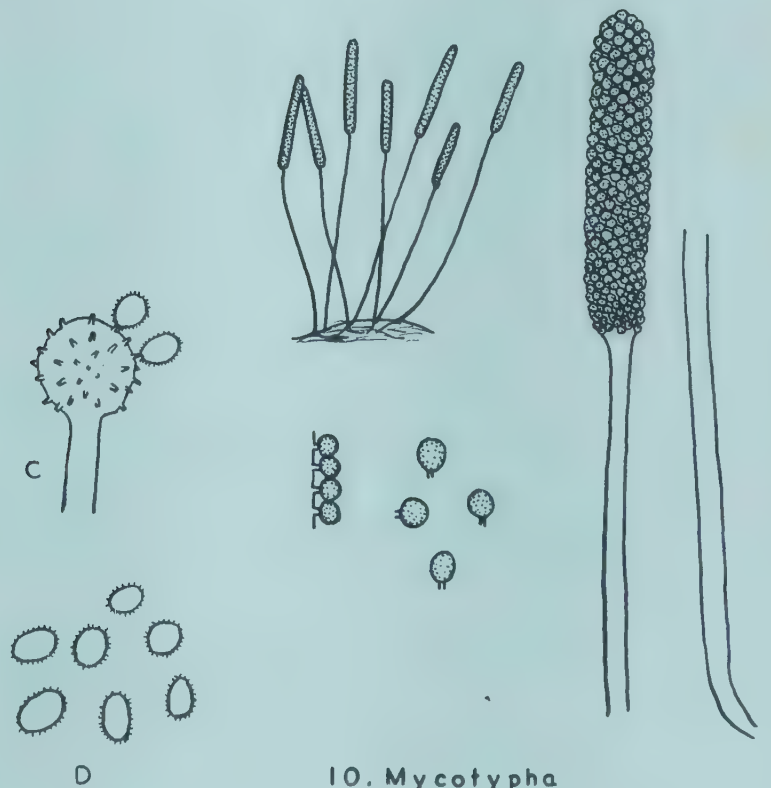
7. *Helicocephalum*



8. *Rhopalomyces*



9. *Cunninghamella*



10. *Mycotypha*

11. *ENDOCOCHLUS* Drechsler. Aerial hyphae slender; haustoria broader, coiled; conidia hyaline, 1-celled, fusoid or ellipsoid, borne singly at intervals on the hyphae; occurring on decaying plant material and destroying amoebae.

Fig. 11. *E. asteroides*; A, haustorium; B, C, mycelium and conidia; redrawn from Drechsler (76).

12. *MARTENSELLA* Coemans. Mycelium sparse; conidiophores upright, simple, bearing lateral or apical sporocladia; conidia borne on upper surface of sporocladia, hyaline, 1-celled; saprophytic.

Fig. 12. *M. corticii*; A, conidiophore; B, sporocladia and spores; redrawn from Jackson and Dearden (168). Other references (25, 184).

13. *KICKXELLA* Coemans. Mycelium sparse; conidiophores simple with an apical disk bearing sporocladia; conidia produced on the upper surface of sporocladia, hyaline, 1-celled; saprophytic on horse dung.

Fig. 13. *K. alabastrina*; A, conidiophore; B, sporocladium and spores; redrawn from Benjamin (25). Other reference (184).

14. *LINDERINA* Raper and Fennell. Conidiophores long, septate, branched, bearing several dome-like sporocladia with phialides and conidia on the upper surface; conidia hyaline, 1-celled, elongated; saprophytic in soil.

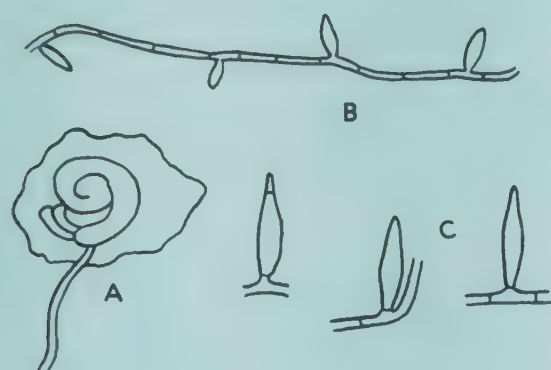
Fig. 14. *L. pennispora*; A, diagram showing habit of growth; B, a single sporocladium; redrawn from Raper and Fennell (217). Other reference (25).

15. *MARTENSIOMYCES* Meyer. Conidiophores (sporangiophores) erect or ascending, becoming irregularly cymosely branched; sporocladia stalked, borne in umbels on recurved branchlets, producing pseudophialides on one side (resembling *Coemansia*); pseudophialides ellipsoid, each bearing a single conidium (sporangiole); spores obclavate, hyaline, enveloped in liquid at maturity; saprophytic, from soil.

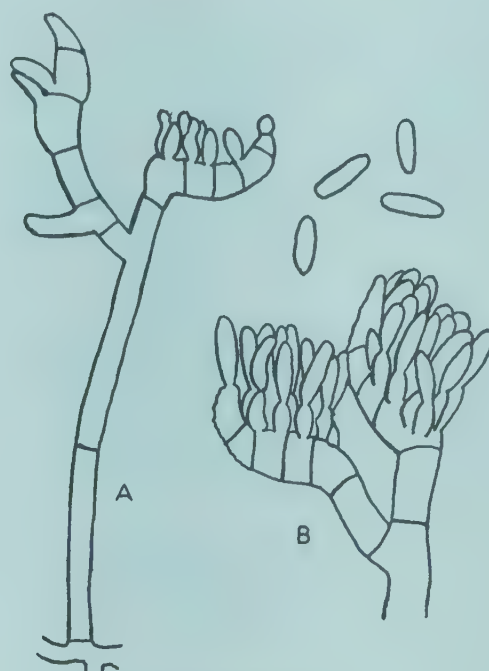
Fig. 15. *M. pterosporus*; redrawn from Benjamin (26). A, sporangiophore; B, group of sporocladia; C, sporocladium; D, sporangiole.

16. *SPIRODACTYLON* Benjamin. Conidiophores (sporangiophores) erect or ascending, septate, giving rise above to coiled, fertile branches; sporocladia borne successively on the lower surface of the coils, septate, with narrowed apices, producing laterally pseudophialides which bear single sporangioles (conidia); spores short-ellipsoid, not enveloped in liquid at maturity; saprophytic, on dung.

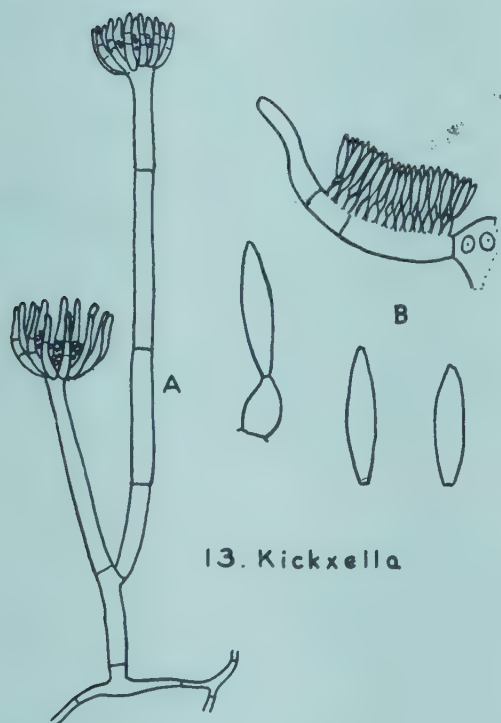
Fig. 16. *S. aureum*; redrawn from Benjamin (26). A, sporangiophore; B, group of sporocladia; C, sporocladium bearing sporangioles.



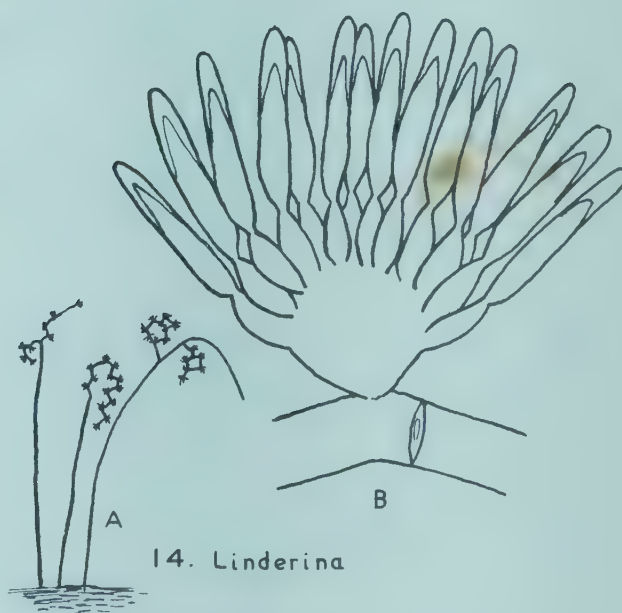
11. *Endocochlus*



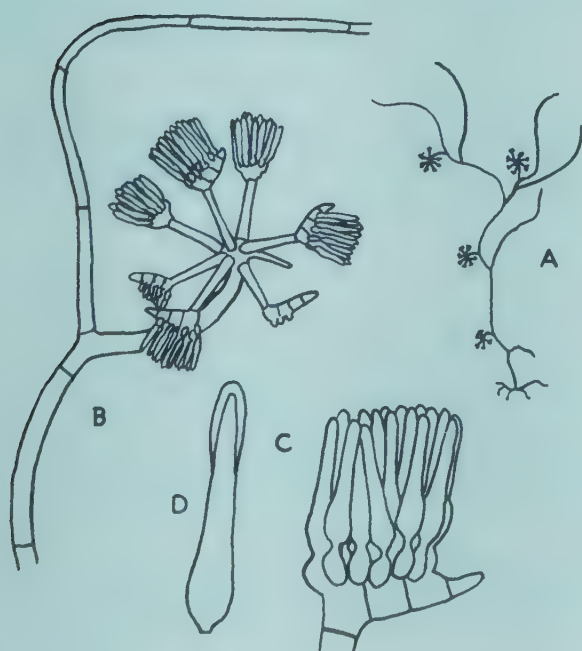
12. *Martensella*



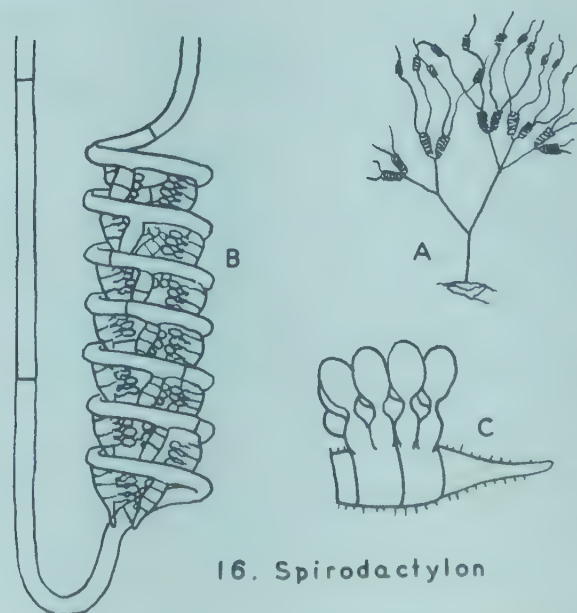
13. *Kickxella*



14. *Linderina*



15. *Martensiomyces*



16. *Spirodactylon*

17. *COEMANSIA* Van Tiegh and Le Monn. Mycelium sparse, non-septate; conidiophores upright, slender, septate, sparingly branched, at intervals bearing sporocladia which produce conidia only on the lower (outer) surface; conidia hyaline, 1-celled, ovoid to fusoid; saprophytic, on dung.

Fig. 17. *C. erecta*; A, conidiophores; B, sporocladia and spores; redrawn from Linder (184). Other reference (25).

18. *PIPTOCEPHALIS* de Bary. Conidiophores (sporangiophores) erect, septate, repeatedly dichotomously branched, tips more or less swollen, deciduous, with sterigmata bearing cylindrical, rod-like sporangioles; sporangioles break up into short conidia at maturity; parasitic on other fungi, principally Mucorales.

Fig. 18. *P. virginiana*; original, from a culture on *Mucor*. A, conidiophore and sporangioles; B, heads of spores; C, chains of spores breaking apart; D, haustorium of parasite in host mycelium. References (26, 175).

19. *SYNCEPHALIS* Van Tiegh and Le Monn. Conidiophores (sporangiophores) upright, straight or bent near the apex, with prominent rhizoids at the base; apex enlarged, sometimes producing branches, bearing rod-like sporangioles which break up to form short spores; saprophytic, or parasitic on other Mucorales.

Fig. 19. *S. pycnosperma*. A, general habit of nearly mature fertile hypha; B, C. formation of separate spores. Redrawn from Thaxter (279). Other reference (26).

20. *DIMARGARIS* Van Tieghem. Conidiophores (sporangiophores) erect, septate, at first simple, becoming irregularly cymosely or verticillately branched and producing fertile terminal heads; sterile branches absent; spore heads composed of many sporiferous branchlets, consisting of short chains of cells formed by budding each cell giving rise to a whorl of 2-spored sporangioles; spores finally separating, immersed in liquid at maturity, ellipsoid or rod-shaped; parasitic on other Mucorales producing branched haustoria.

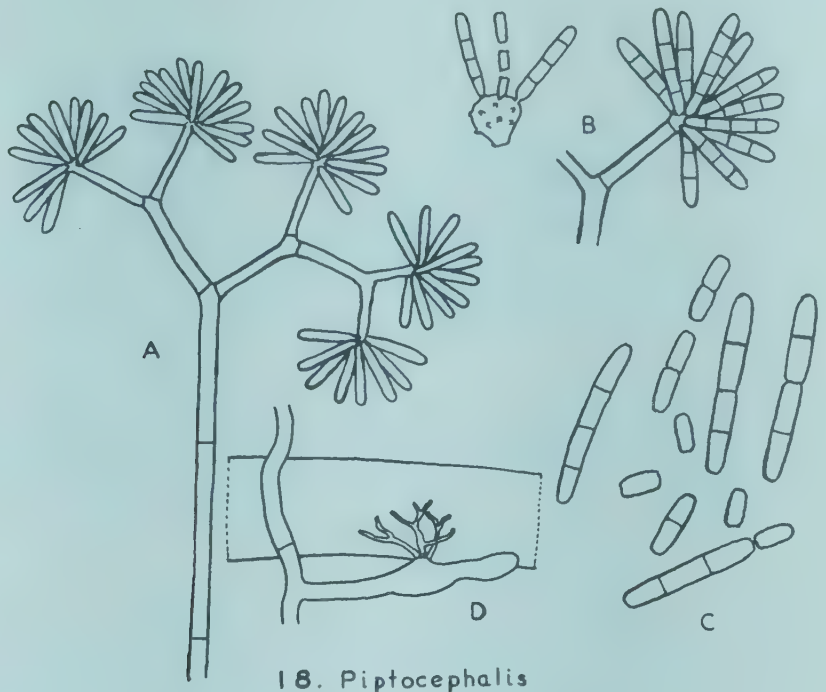
Fig. 20. *D. verticillata*; redrawn from Benjamin (26). A, upper portion of sporangiophore; B, enlarged branch apex; C, branchlet with several 2-spored sporangioles; D, spores.

21. *TIEGHEMIOMYCES* Benjamin. Conidiophores (sporangiophores) erect, septate, simple below, giving rise above to fertile branch systems; branches septate, several repeatedly, irregularly branched, the ends consisting of fertile cells bearing whorls of 2-spored sporangioles; spores finally separating, smooth subglobose to ovoid, dry at maturity; parasitic on other Mucorales, producing branched haustoria.

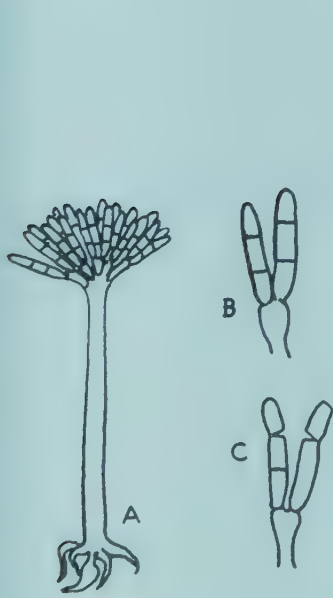
Fig. 21. *T. californicus*; redrawn from Benjamin (26). A, habit of sporangiophores; B, branch of sporangiophore; C, branchlets with 2-spored sporangioles; D, spores.



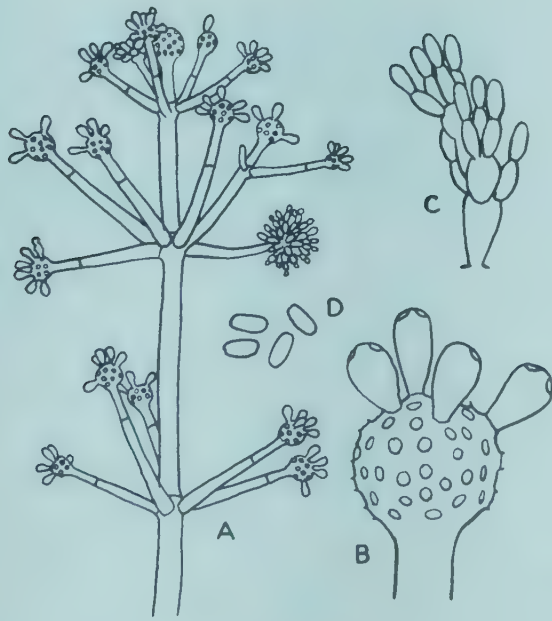
17. *Coemansia*



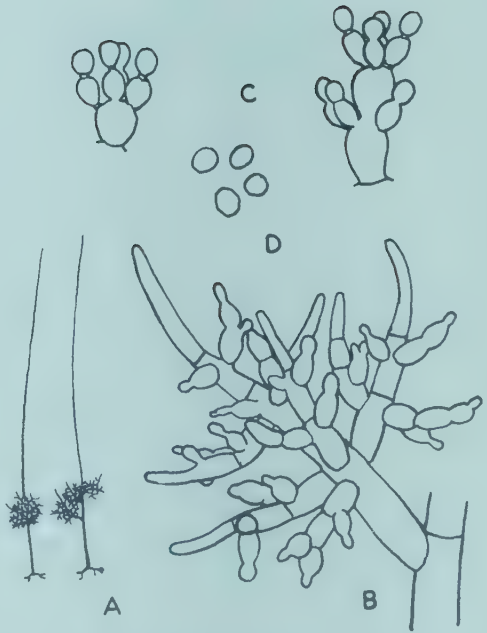
18. *Piptocephalis*



19. *Syncephalis*



20. *Dimargaris*



21. *Tieghemiomyces*

22. *SYNCEPHALASTRUM* Schroet. Mycelium growing rapidly, abundantly branched; conidiophores (sporangiphores) erect, branched, tips enlarged bearing a head of rod-shaped sporangioles, each producing a row of nearly spherical spores, resembling a chain of conidia; wall of sporangiole dissolving to release spores; saprophytic

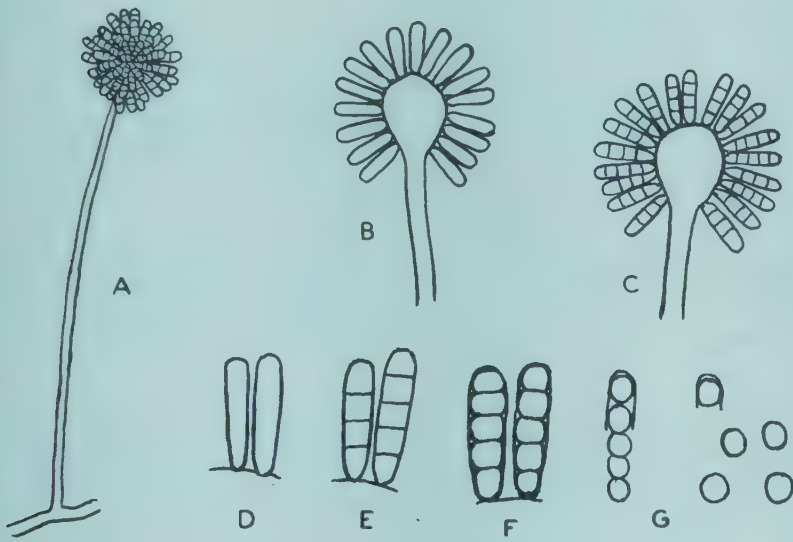
Fig. 22. *S. racemosum*; original, from pure culture. A, conidiophore and head of spores; B, C, heads of sporangia and developing spores, D-G, stages in formation and release of spores. References (26, 279).

23. *CHOANEPHORA* Currey. Mycelium white, extensive and growing rapidly in culture; conidiophores (sporangiphores) long, enlarged and branched at the apex, each branch bearing a head of conidia (sporangioles); conidia 1-celled, brown or purplish, ellipsoid; sporangia typical of the Mucorales also formed in culture; parasitic on flowers and fruits, or saprophytic.

Fig. 23. *C. cucurbitarum*; original, from culture. A, conidiophore; B, C, portion of head of conidia; D, conidia. References (100, 212, 294).

24. *DISPIRA* Van Tiegh. Conidiophores (sporangiphores) erect, branched, the sterile branches slender and spiral, fertile branches enlarged, bearing a head of cylindrical sporangioles which produce rows of short spores; parasitic on other Mucorales.

Fig. 24. *D. americana*. A, terminal portion of fertile hypha; B, portion of fertile head showing spores. Redrawn from Thaxter (278). Other references (8, 26).



✓ 22. *Syncephalastrum*



23. *Choanephora*



24. *Dispira*

MONILIALES

25. *STREPTOMYCES* Wak. and Henrici. Mycelium very slender; colonies compact, usually small on agar, emitting characteristic "earthy" odor; spores minute, produced in chains by segmentation of hyphae; common in soil; frequently classified among the bacteria, in the Actinomycetales.

Fig. 25. *Streptomyces* sp.; original, from culture. A, appearance of mycelium and spores under high power, and B, under the oil immersion objective, both dry mounts.

26. *GEOTRICHUM* Link. Mycelium white, septate; conidia (oidia) hyaline, 1-celled, short cylindrical with truncate ends, formed by segmentation of hyphae; saprophytic, common in soil. Some basidiomycetes form spores in this manner.

Fig. 26. *Geotrichum albidum*; original, from agar culture. Reference (45).

27. *MONOSPORIUM* Bon. Conidiophores dendroid, repeatedly branched, erect, hyaline; conidia borne singly at the apex of branches, 1-celled, hyaline or lightly colored; saprophytic. See Hughes (153) for comments on validity of this genus.

Fig. 27. *M. rubrum*; redrawn from Satory, Satory and Meyer (227).

28. *NEMATOCOTONUS*. Mycelium not extensive, provided with clamp connections; assimilative hyphae developing within minute animals; conidia mostly hyaline, 1-celled, produced singly on short, simple or forked sterigmata; chiefly attacking nematodes in soil.

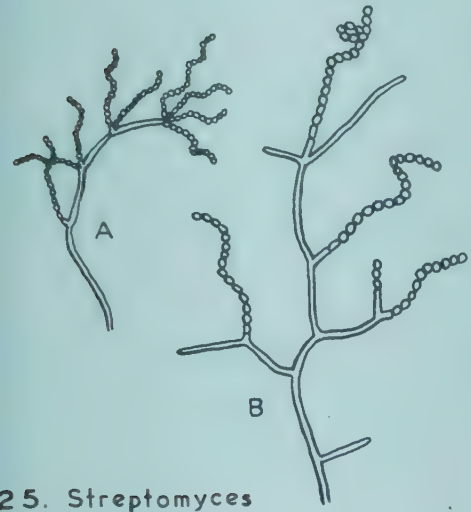
Fig. 28. *N. haptocladus*; redrawn from Drechsler (84). Other reference (83).

29. *MONILIA* Pers. Mycelium white or gray, abundant in culture; conidia pink, gray, or tan in mass, 1-celled, short cylindric to rounded, catenulate, formed acropetally; conidiophore branched, its cells differing little from the older conidia. Some species are imperfect stages of *Neurospora* and are common saprophytes; others, whose perfect states are *Monilinia* (*Sclerotinia*) spp., cause brown rots of fruits. Other fungi, such as species of *Candida*, have been called *Monilia*, especially in medical literature.

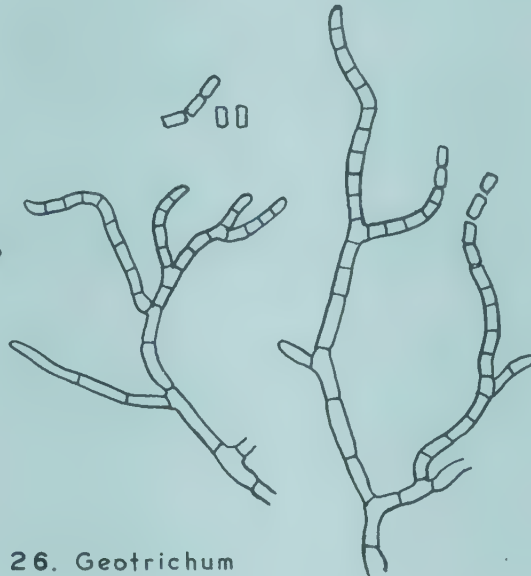
Fig. 29. A, *M. (Neurospora) sitophila*; B, *M. americana* (*Monilinia fructicola*); both original, from pure culture.

30. *CANDIDA* Berkhout. (*Monilia*, *Geotrichoides*). Mycelium septate, not extensive, closely appressed or submerged in culture; mostly covered with conidia; conidia hyaline, 1-celled, ovoid to fusoid, forming short chains by budding; produced apically or laterally on mycelium; conidiophores lacking; mostly common saprophytes; *C. albicans* is described as causing moniliasis of man; frequently considered as a filamentous yeast.

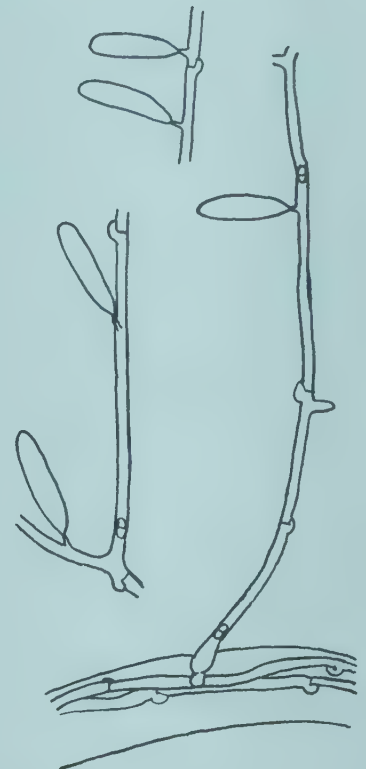
Fig. 30. *Candida albicans*; A, B, hyphae and conidia under different magnifications; C, cell of hypha showing lateral production of conidia; D, conidia budding; original, from culture. Reference (54).



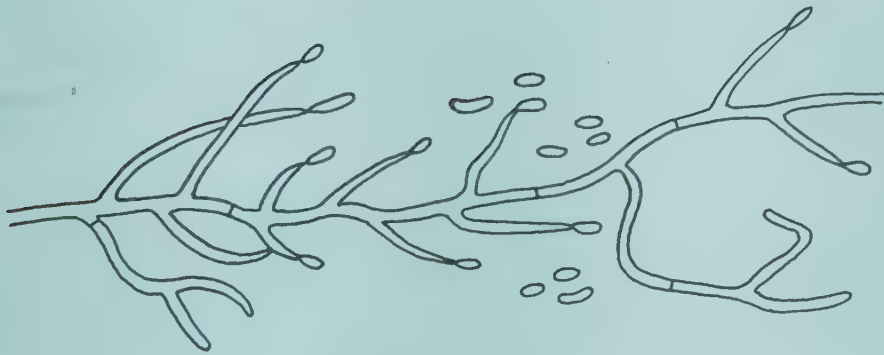
25. *Streptomyces*



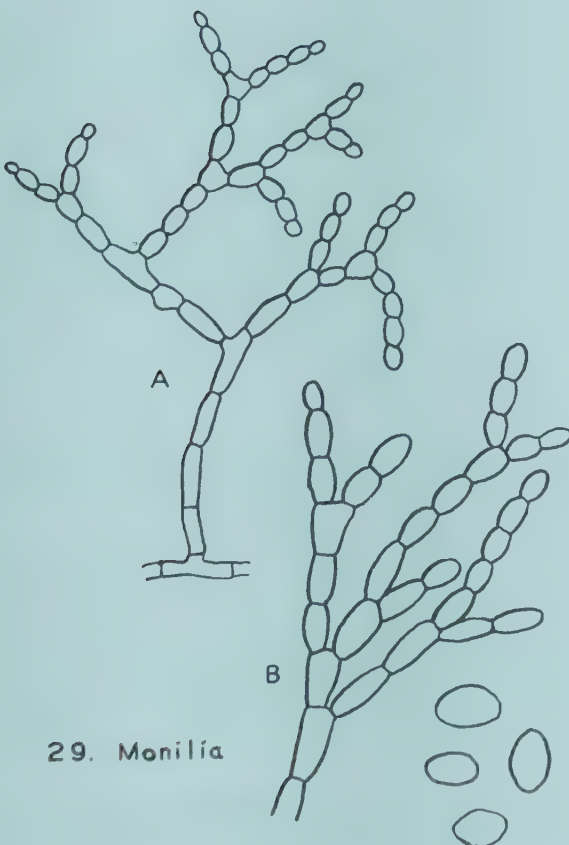
26. *Geotrichum*



28. *Nematocionus*



27. *Monosporium*



29. *Monilia*



30. *Candida*

31. **OIDIUM** Sacc. **ACROSPORIUM** Nees. Mycelium external on host, white; conidiophores upright, simple; conidia cylindric, 1-celled, hyaline, catenulate, produced basipetally; parasitic on higher plants, producing powdery mildews. The genus name *Oidium* has also been used for species of *Monilia*, *Rhynotrichum* and *Oospora*. See Hughes (153) for relation of *Oidium* Link., *Oidium* Sacc. and *Acrosporium* Nees.

Fig. 31. *Oidium monilioides* (*Erysiphe graminis*); original, from fresh material. A, B, mycelium with conidiophores and conidia; C, conidia. Reference (32).

32. **SPOROBOLOMYCES** Kluyver and van Niel. Cultures red, pink or white; cells ovoid, elongate or making up true mycelium; reproduction principally by budding; some cells producing sterigmata, each bearing an asymmetrical spore which is discharged forcibly; saprophytic.

Fig. 32. *S. salmonicolor*; original, from culture. A, hyphae with conidia produced on sterigmata; B, budding cells, Reference (40).

33. **ITERSONILIA** Derx. Mycelium hyaline, septate, forming clamp connections; aerial hyphae simple, forming a sterigma at the apex where a single spore is formed: spores asymmetrical, smooth, hyaline, discharged forcibly; saprophytic, or pathogenic on plants.

Fig. 33. *I. perplexans*; redrawn from Tubaki (284).

34. **CEPHALOSPORIUM** Corda. Conidiophore slender or swollen, simple; conidia hyaline, 1-celled, produced successively at the tip and collecting in a slime drop, produced endogenously in some species; saprophytic or parasitic, some species causing vascular wilts of trees. Microspores of certain species of *Fusarium* are similar and may be confused.

Fig. 34. *Cephalosporium* sp.; A, conidia contained in slime drops, from a dry mount; B, conidia as seen in a water mount; C, detail of spore production; original, from culture. References (210, 225).

35. **CYLINDROCEPHALUM** Bon. Mycelium hyaline; conidiophores short, cylindrical, pointed at the apex, arising from aerial hyphae, simple, sometimes septate; conidia 1-celled, cylindrical or ellipsoid, produced successively at the apex of the conidiophore and held together in loose clusters, hyaline; saprophytic.

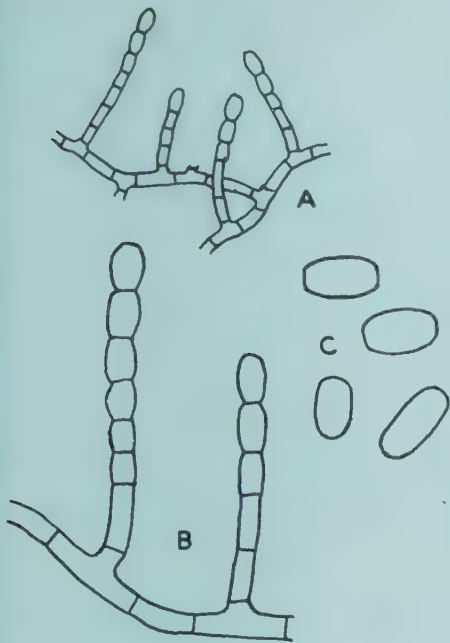
Fig. 35. *C. coprophilum*; redrawn from Tubaki (285).

36. **ACREMONIUM** Link. Mycelium prostrate, slender, producing simple upright conidiophores; conidia hyaline, 1-celled, borne singly, apically; saprophytic.

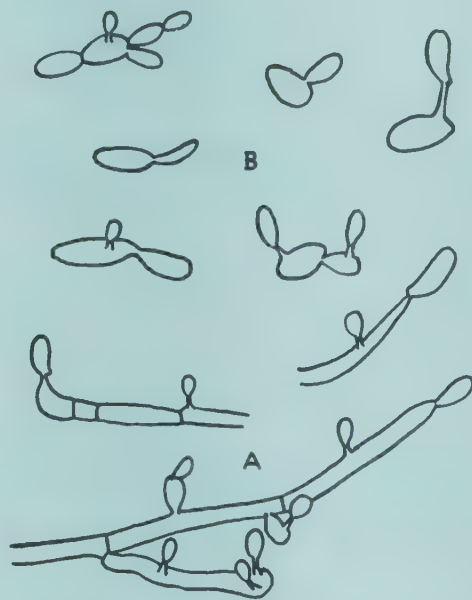
Fig. 36. *Acremonium* (?) sp.; original, from culture.

37. **GLOMERULARIA** Peck. Conidiophores borne in groups in spots on living leaves, mostly short, simple or divided; conidia globose, somewhat unequally clustered forming few-spored heads, 1-celled, hyaline; parasitic on leaves.

Fig. 37. *G. corni*; original from herbarium material on leaves of *Cornus canadensis*; A, habit on leaf; B, conidiophores and conidia.



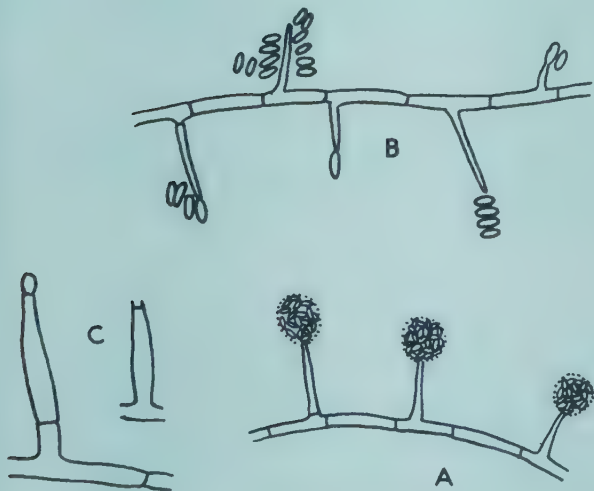
31. Oidium



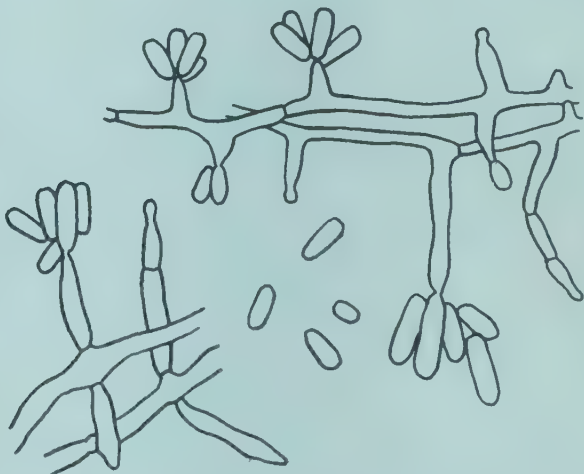
32. Sporobolomyces



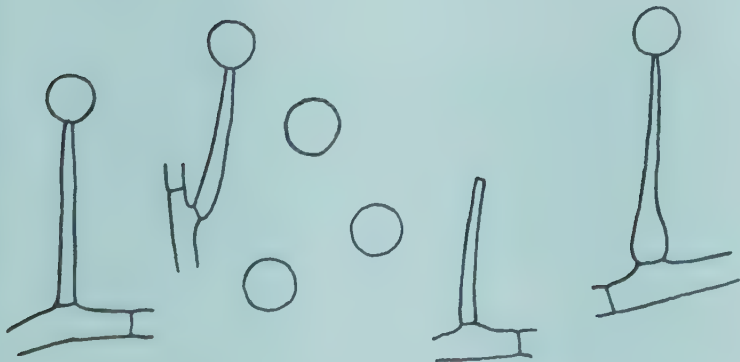
33. Itersonilia



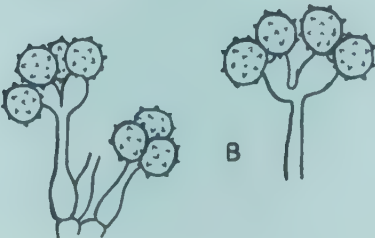
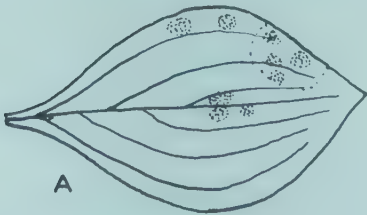
34. Cephalosporium



35. Cyindrocephalum



36. Acremonium



37. Glomerularia

38. OEDOCEPHALUM Preuss. Conidiophores simple, hyaline, enlarged at the apex, bearing a head of conidia; conidia hyaline, 1-celled, globose or ovoid; saprophytic on plant materials.

Fig. 38. *Oedocephalum* sp.; original, from culture. References (276, 285).

39. HARPOSPORIUM Lohde. Mycelium not extensive, bearing lateral, globose phialides singly or in groups; conidia hyaline, 1-celled, elongated, curved to hooked; occurring in leaf mold and destroying nematodes.

Fig. 39. A, *H. oxycoracum*; redrawn from Drechsler (83); B, *H. anguillulae*; redrawn from Karling (172).

40. MERIA Vuill. Mycelium hyaline, branched; conidiophores simple, elongate, septate; conidia hyaline, 1-celled, produced singly or in clusters on lateral or apical sterigmata; attacking and destroying nematodes.

Fig. 40. *M. coniospora*; A, portion of nematode showing several conidiophores produced under agar medium; B, conidiophore on the surface of the medium. Redrawn from Drechsler (83).

41. HANSFORDIA Hughes. Conidiophore stalk hyaline to brown, erect to repent, lower part unbranched, branched above repeatedly and irregularly, the ultimate branches bearing conidia; sporogenous cells elongated, flexuous, denticulate; conidia attached at apex and sides of sporogenous cells on blunt teeth, 1-celled, hyaline, globose, ovoid or fusoid; on leaves.

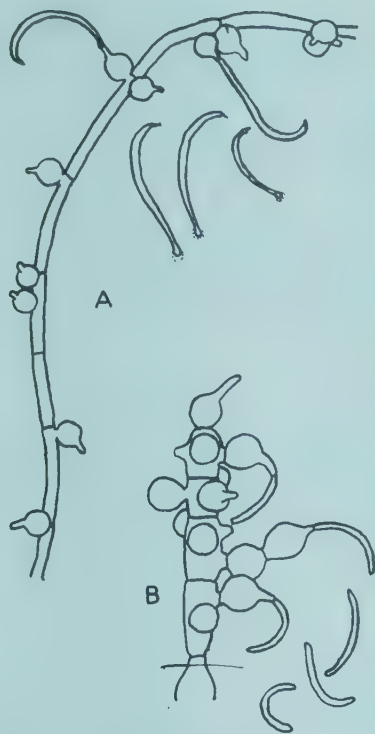
Fig. 41. *Hansfordia* sp.; original, from culture. Reference (130).

42. BOTRYOPHIALOPHORA Linder. Aerial mycelium white to dilute fuscous with age, loosely branched; conidiophores (phialides) hyaline, rarely 1 or 2 borne at sides or ends of short branches, usually 3-20 arising from a subglobose, enlarged cell which arises from the side of the main hypha, becoming branched below, flask- or vase-shaped; conidia 1-celled, hyaline or bright-colored, tending to aggregate in globose clusters; the only known species collected on drift wood in salt water.

Fig. 42. *B. marina*; redrawn from Barghoorn and Linder (11).



38. *Oedocephalum*



39. *Harposporium*



40. *Meria*



41. *Hansfordia*



42. *Botryophialophora*

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43. **DIMORPHOSPORA** Tubaki. Mycelium aquatic, septate, branched, hyaline; aerial conidiophores penicillately branched, forming flask-shaped phialides with conspicuous collarettes, through which endospores emerge; conidia aggregating in heads at the apex of the phialides, not in mucus, 1-celled, hyaline, globose; submerged conidiophores similarly branched but producing buds at apices; aquatic, saprophytic on dead leaves.

Fig. 43. *D. foliicola*; redrawn from Tubaki (287). A, aerial conidiophores and conidia; B, submerged conidiophore. See Ingold (161, 162) for a description of the same fungus under the name of *Fluminispora ovalis*.

44. **CIRCINOTRICHUM** Nees. Superficial, spreading over the surface of leaves, velvety; sterile hyphae erect, septate, branched; branches tapering, flexuous, gray to hyaline; conidiophores short, cylindrical, hyaline, 1-celled; conidia acrogenous, not in chains, cylindrical-fusiform, 1-celled, hyaline; saprophytic on leaves.

Fig. 44. *C. maculiforme*; redrawn from Ahmad (4).

45. **POLYSCYTALUM** Reiss. Conidiophores upright, mostly simple, hyaline, short, grouped; conidia 1-celled, hyaline, cylindrical, truncate at both ends, arising in chains from the apex of the conidiophores; saprophytic on vegetation.

Fig. 45. *P. sericeum*; original, from herbarium material on dead oak leaf.

46. **TRICHODERMA** Pers. Conidiophores hyaline, upright, much branched, not verticillate; phialides single or in groups; conidia hyaline, 1-celled, ovoid, borne in small terminal clusters; usually easily recognized by its rapid growth and green patches or cushions of conidia; saprophytic in soil or on wood, very common, some species reported as parasites on other fungi.

Fig. 46. *T. lignorum*; original, from pure culture. A, B, large conidiophores showing extensive branching; C, D, phialides showing production of conidia; E, conidia.

47. **OVULARIA** Sacc. Conidiophores emerging from leaves in clusters, simple or branched; conidia hyaline, 1-celled, ovoid or globose, apical or lateral, single or less often catenulate; parasitic on leaves of higher plants. See Hughes (153) for synonymy with *Ramularia* Unger.

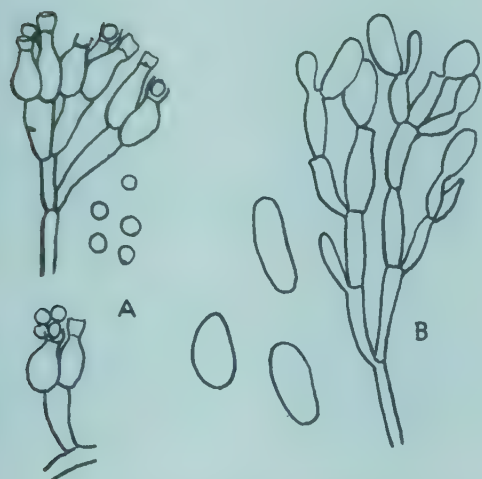
Fig. 47. *O. avicularis*; A, clusters of conidiophores showing habit; B, conidiophores and conidia. Original, drawn from herbarium material on *Polygonum aviculare*. Reference (244).

48. **CYLINDROPHORA** Bon. Conidiophores erect arising from aerial hyphae, branched; conidia 1-celled, hyaline, formed successively at the apex of the branches (phialides), often in small clusters, clavate, ellipsoid or long-pyriform; conidial formation similar to that of *Trichothecium roseum*; saprophytic on fleshy fungi.

Fig. 48. *C. apiculata*; redrawn from Tubaki (286).

49. **SPOROTRICHUM** Link. Conidiophores hyaline, sometimes simple, usually irregularly branched, with spore bearing portion near the apex; conidia hyaline, 1-celled, globose or ovoid, attached apically and laterally; saprophytic in soil, parasitic on higher plants or pathogenic on animals.

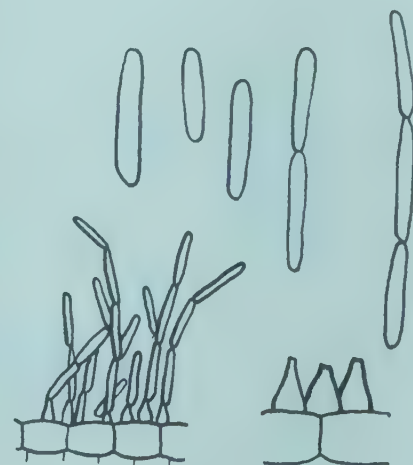
Fig. 49. *Sporotrichum* sp.; original, from culture isolated from soil. A, complete branched conidiophore; B, branches of conidiophore and conidia. References (54, 71).



43. *Dimorphospora*



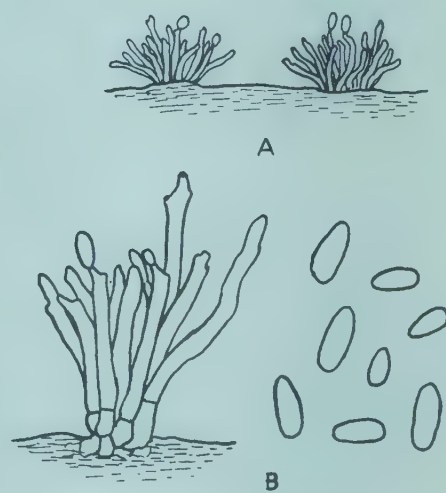
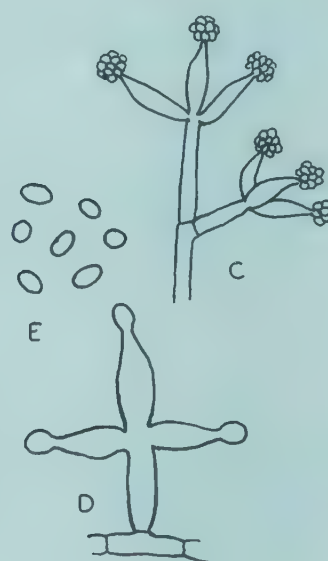
44. *Circinotrichum*



45. *Polyscytalum*



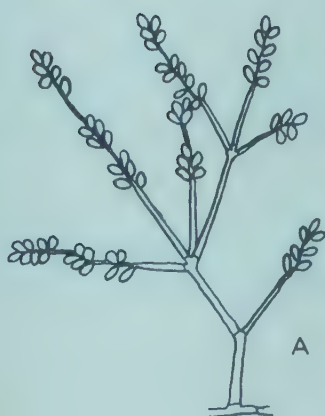
46. *Trichoderma*



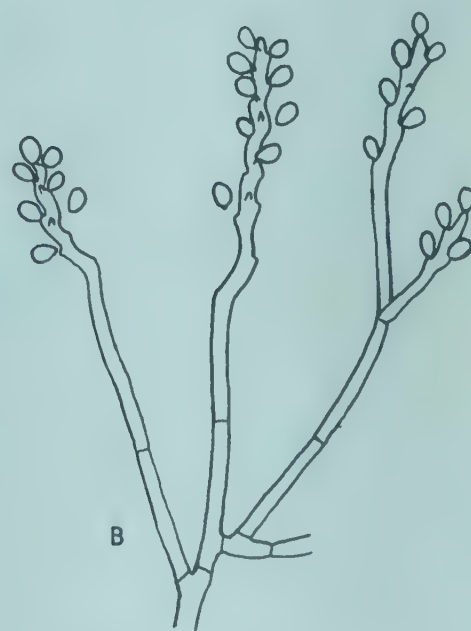
47. *Ovularia*



48. *Cylindrophora*



49. *Sporotrichum*



50. *VERTICILLIUM* Nees. Conidiophores slender, branched, at least some of the branches verticillate (in whorls); conidia ovoid to ellipsoid, hyaline, 1-celled, borne singly or in small clusters apically; vascular parasites causing wilts of higher plants, parasitic on other fungi, or growing saprophytically.

Fig. 50. *V. albo-atrum*; original, from pure culture. A-C, conidiophores growing in moist atmosphere showing small clusters of conidia; C, simple conidiophores; D, conidiophore in water mount; E, conidia. References (164, 165, 221).

51. *CALCARISPORIUM* Preuss. Conidiophores hyaline, slender the larger ones verticillately branched; conidia hyaline, 1-celled, mostly oblong, borne singly on wart-like teeth on apical portions of the conidiophore branches, forming loose clusters; principally parasitic on other fungi.

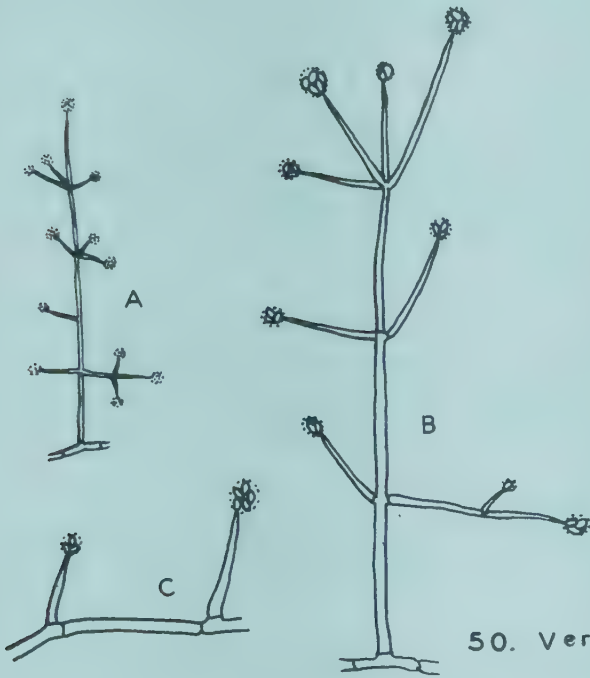
Fig. 51. *C. arbuscula*; original, from culture isolated from growth on fruit body of *Lachnella* sp. A, branched conidiophore with clusters of conidia; B, branches with apical sterigmata; C, conidia. References (13, 130, 286).

52. *ACROSTALAGMUS* Corda. Conidiophores slender with verticillate branches; conidia hyaline, 1-celled, mostly ovoid, held together in heads in slime drops; parasitic or saprophytic. This genus is very close to *Verticillium* and is believed by some to be synonymous with it. Presented here because of its frequent reference in the literature.

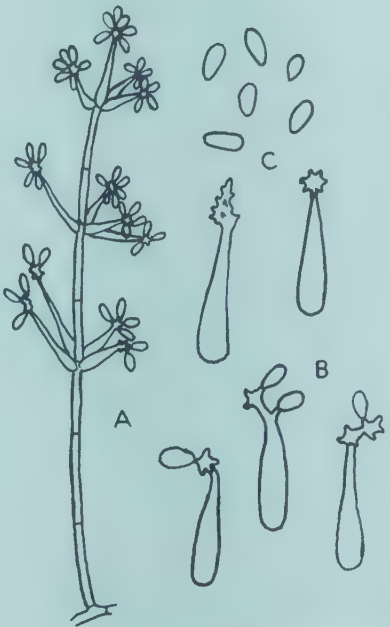
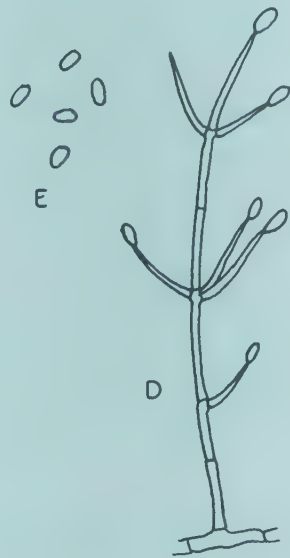
Fig. 52. *A. cinnabarinus*; original, from culture obtained from potato tuber. A, B, conidiophores showing spore-heads in slime drops; C, conidiophore from water mount.

53. *SEPEDONIUM* Link. Conidiophores slender, typically verticillately branched but branching sometimes sparse; conidia hyaline, 1-celled, ovoid, borne singly at the apex (like *Verticillium*); chlamydospores abundant, large, spherical, apical, bright yellow, tuberculate; parasitic on fleshy fungi, common on *Boletus*; imperfect stage of *Hypomyces*.

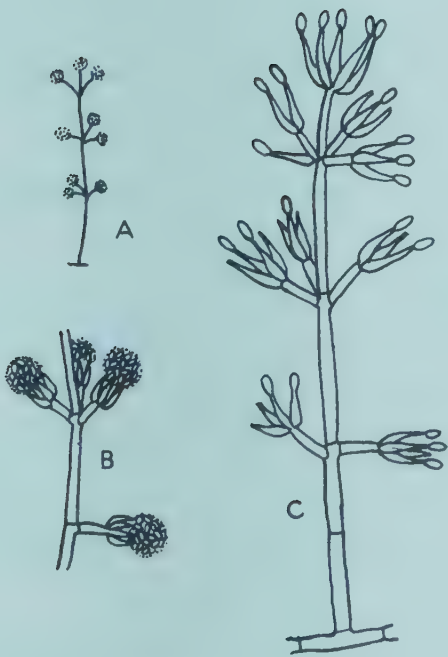
Fig. 53. *S. ampullosporum*; original, from parasitized *Boletus*. A, conidiophores and conidia; B, chlamydospores. References (62, 286).



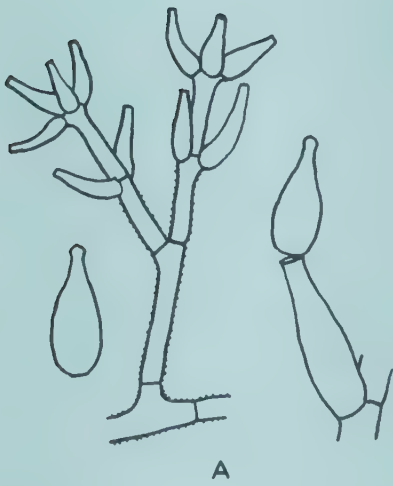
50. *Verticillium*



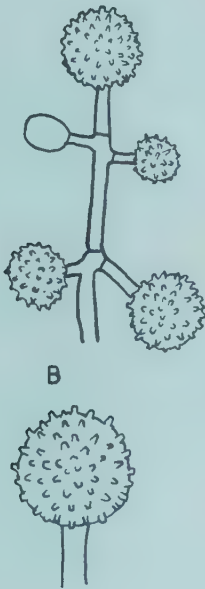
51. *Calcarisporium*



52. *Acrostalagmus*



53. *Sepedonium*



54. **BLASTOMYCES** Cost. and Roll. Mycelium white in culture, filamentous at room temperature, yeast-like at 37° C.; thick-walled, budding cells found in lesions; pathogenic in man, causing blastomycosis.

Fig. 54. *B. dermatitidis*. A, hyphae and thick-walled cells produced in culture; B, bud-cells produced in tissue; C, budding cells on media at 37° C. A, B, redrawn from Delamater (68); C, drawn from a photograph by Salvin (226). Other reference (54).

55. **STEPHANOMA** Wallr. Conidiophores slender, typically verticillately branched; similar to *Verticillium*; conidia hyaline, 1-celled, apical; chlamydospores spherical, tuberculate, developing as in *Sepedonium* but with a few smooth, globose swellings protruding from the wall; parasitic on fleshy fungi; imperfect stage of *Hypomyces*.

Fig. 55. *S. tetracoccum*; A, hyphae and chlamydospores; B, conidiophores. Redrawn from Howell (123).

56. **HISTOPLASMA** Darling. Cultures similar to *Blastomyces* but large, thick-walled, tuberculate, spherical chlamydospores formed in culture at room temperature; growth yeast-like, at 37° C.; pathogenic in man, causing histoplasmosis.

Fig. 56. *H. capsulatum*. A, hyphae and tuberculate chlamydospores; B, stages in the development of tuberculate chlamydospores; C, smooth-walled chlamydospores developed below the surface of the agar. Redrawn from Howell (123). Other reference (54).

57. **CHLAMYDOMYCES** Bain. Conidiophores stout, short, with inflated apex bearing short phialides; conidia hyaline, small, produced endogenously and collecting in mucilaginous masses; chlamydospore large, ovoid, tuberculate-ridged, colored, with a hyaline basal cell, similar in appearance to *Mycogone*; imperfect stage of *Hypomyces*.

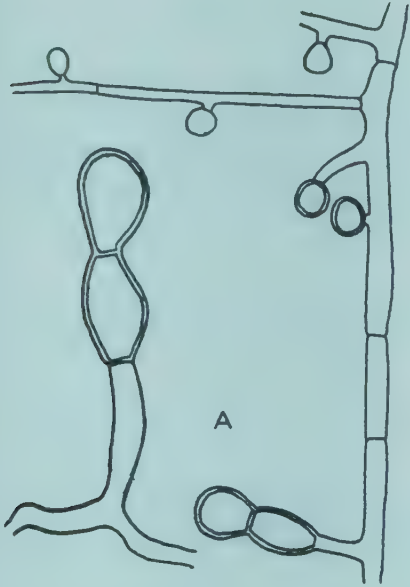
Fig. 57. *C. palmorum*; A, conidiophores; B, hyphae and chlamydospores. Redrawn from Howell (123).

58. **MYCOGONE** Link. Conidiophores slender, typically verticillately branched; conidia hyaline, 1-celled, borne apically, much like *Verticillium*; chlamydospores large, spherical, bright-colored, warty, terminal, with a large inflated colorless cell below the chlamydospore; parasitic on mushrooms, probably imperfect stage of *Hypomyces*.

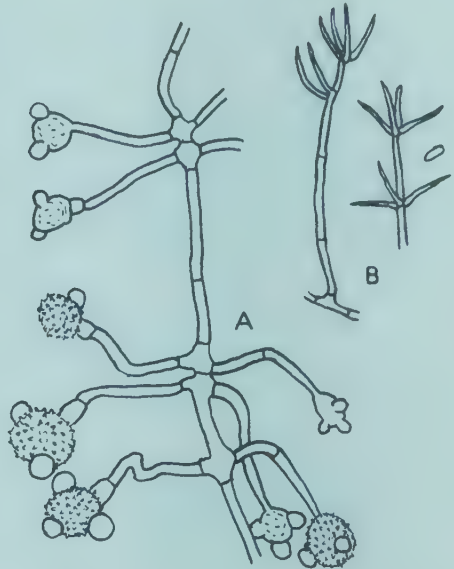
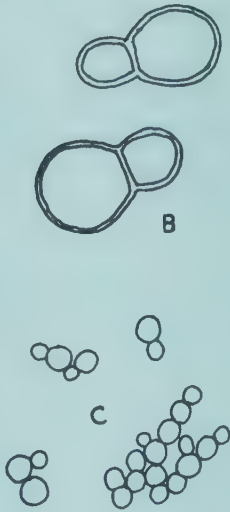
Fig. 58. *M. perniciosa*; A, conidiophore and conidia; B, hyphae and chlamydospores. Redrawn from Howell (123).

59. **BEAUVERIA** Vuill. Mycelium white or slightly colored with a white fluffy to powdery appearance; conidiophores single, irregularly grouped or in verticillate clusters; in some species inflated at the base, tapering to a slender spore bearing portion which appears zigzag after several spores are produced; conidia hyaline, rounded to ovoid, 1-celled, borne singly on small sterigmata; parasitic on insects.

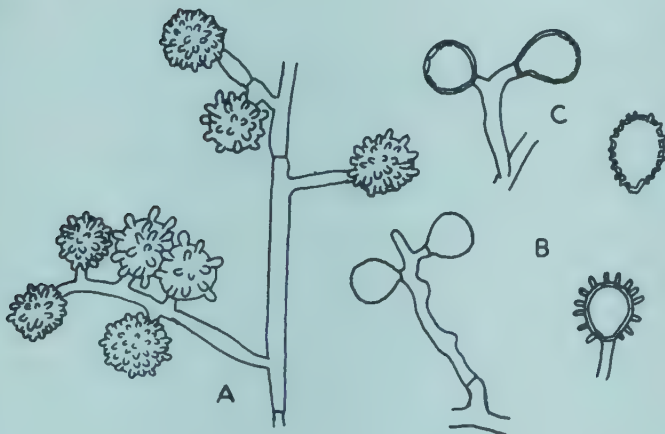
Fig. 59. *B. bassiana*; original, from culture obtained from dead Nitidulid beetle. A, infected beetle; B, C, D, clusters of conidiophores; E, single conidiophores; F, conidia. References (24, 187).



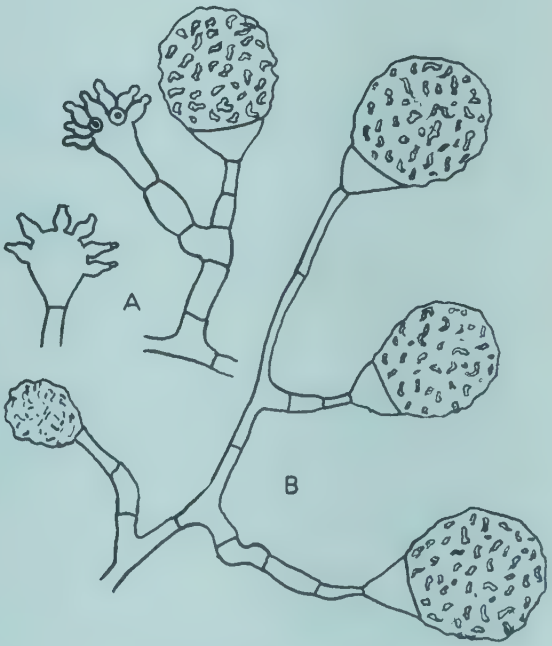
54. Blastomyces



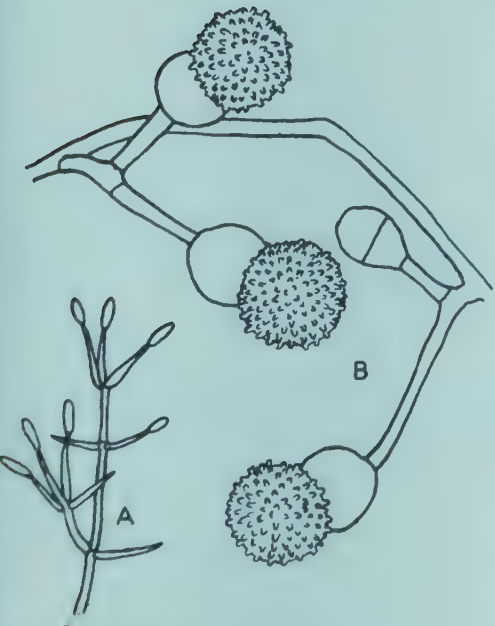
55. Stephanoma



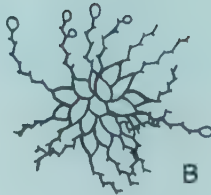
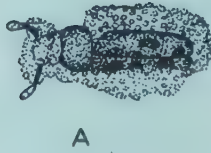
56. Histoplasma



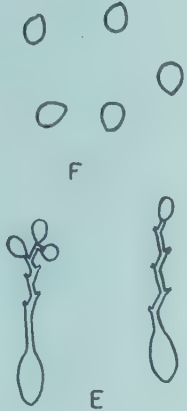
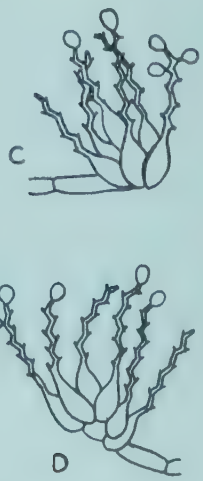
57. Chlamydomyces



58. Mycogone



59. Beauveria



60. *TRITIRACHIUM* Limber. Conidiophores upright, long, slender, verticillately branched, apical branches tapering to a rachis-like, zig-zag, conidia-bearing portion; conidia apical and lateral, hyaline, 1-celled, globose or ovoid, saprophytic. (Note similarity to *Beauveria*).

Fig. 60. *T. album*; A, conidiophore; B, conidia-bearing branch. Redrawn from Limber (177). Other reference (187).

61. *PACHYBASIIUM* Sacc. Conidiophores upright, branched, some branches sterile, ending in slender hyphae; fertile branches short, verticillate; conidia hyaline, 1-celled, globose; saprophytic.

Fig. 61. *P. tilletii*; redrawn from Grove (113).

62. *FUSIDIUM* Link. Conidiophores usually short, simple or sparingly branched; conidia hyaline, 1-celled, ellipsoid to fusoid, catenulate; saprophytic or parasitic.

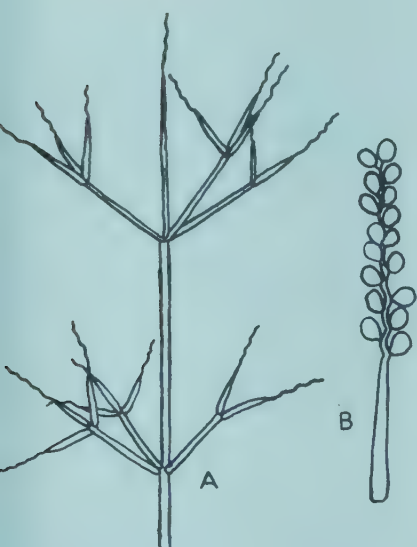
Fig. 62. *Fusidium* sp.; original, from culture. A, B, conidiophore and chains of conidia; C, conidia. Reference (10).

63. *OIDIODENDRON* Robak. Mycelium hyaline to brown; conidiophores tree-like, sparsely branched only on upper portion, rebranched irregularly, branches segmenting into rod-shaped or rounded conidia, remaining in chains; conidia 1-celled, hyaline or subhyaline; saprophytic.

Fig. 63. *O. griseum*; original, from culture. A, branched conidiophore; B, segmenting branch; C, conidia.

64. *RHINOTRICHUM* Corda (*Oidium* Link.). Mycelium often forming a loose or dense substratum; conidiophores erect or sub-erect, simple or branched; spore-bearing cells sometimes enlarged; conidia 1-celled, globose to ovoid, hyaline or slightly colored, borne on tooth-like sterigmata; saprophytic mostly on decayed wood. The genus name *Oidium* has been used for species of *Rhinotrichum*, but see Bisby (32).

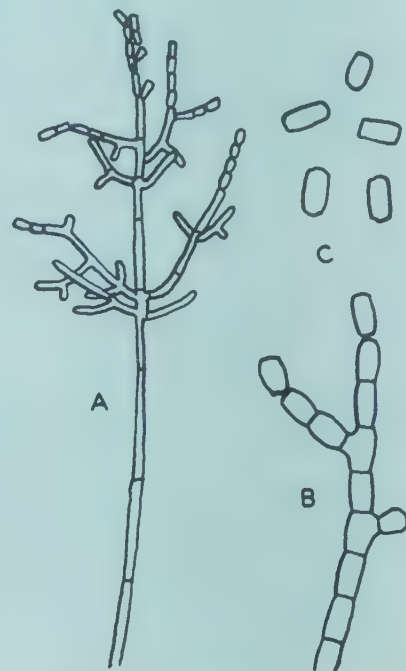
Fig. 64. A, B, *R. curtisii*; original, drawn from herbarium material; C, *R. macrospora*, macroconidial and microconidial stages, original from culture. References (32, 183, 270).



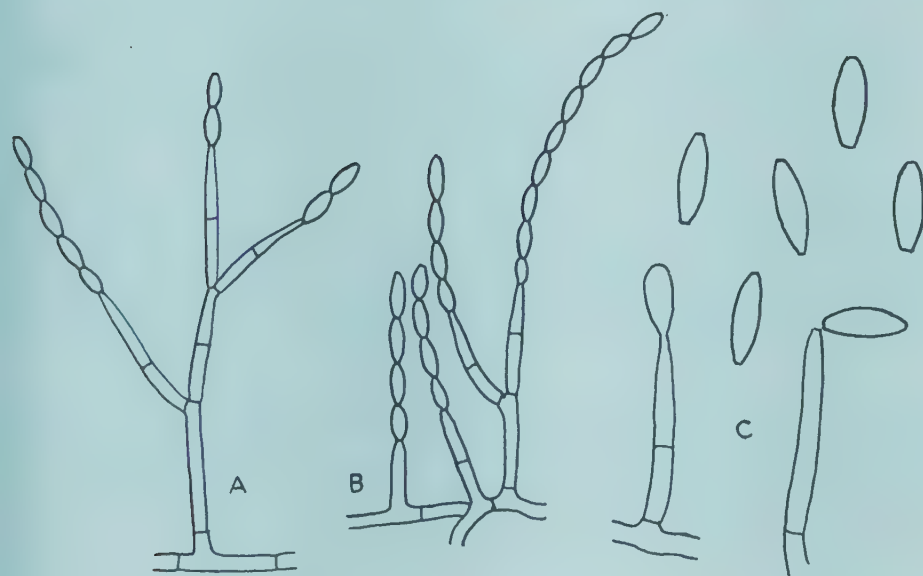
60. *Tritirachium*



61. *Pachybasium*



63. *Oidiodendron*



62. *Fusidium*



64. *Rhinotrichum*



65. *BOTRYTIS* Pers. Conidiophores long, slender, often pigmented, branched, the apical cells enlarged or rounded, bearing clusters of conidia on short sterigmata; conidia hyaline or ash-colored, gray in mass; 1-celled, ovoid; black irregular sclerotia frequently produced; parasitic, causing "gray mold" of many plants, or saprophytic.

Fig. 65. *B. cinerea*; original, from culture. A, B, conidiophores and conidia; C, D, upper portions of conidiophores showing swollen tips; E, conidia.

66. *GONATOBOTRYS* Corda. Conidiophores erect, sometimes tall, septate, simple or sparingly branched, with terminal and intercalary, inflated, denticulate cells bearing conidia; conidia borne singly on the teeth, 1-celled, hyaline, ovoid to subglobose; saprophytic or parasitic on other fungi. This genus differs from *Gonatobotryum* in being hyaline throughout, and from *Gonatorrhodiella* in having spores not in chains.

Fig. 66. *G. simplex*; original, from culture. Reference (85).

67. *BOTRYOSPORIUM* Corda. Conidiophores tall, slender, hyaline, producing numerous, lateral branches of nearly equal length, these branches producing two or more secondary branches which are enlarged at the tips and bear heads of conidia; conidia hyaline, 1-celled, ovoid; saprophytic on decaying plant material.

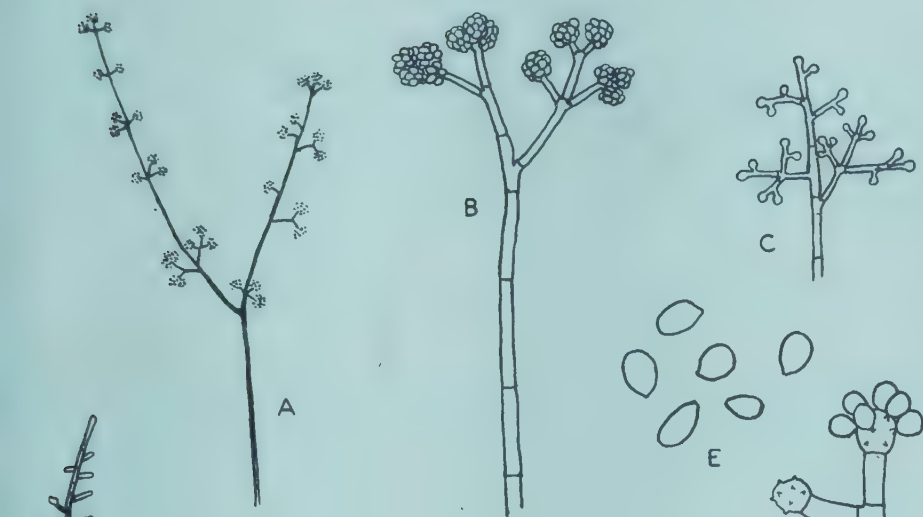
Fig. 67. *Botryosporium* sp.; original, from decayed leaf in greenhouse. A, entire conidiophore; B-F, stages in development of conidiophore branch and production of conidia; G, conidia.

68. *MONOCILLIUM* Saksena. Conidiophores simple, septate, consisting of a long pedicel surmounted by a single typical phialide which bears a long chain of conidia formed basipetally; conidia 1-celled, hyaline, ovoid to ellipsoid, smooth; saprophytic, from soil.

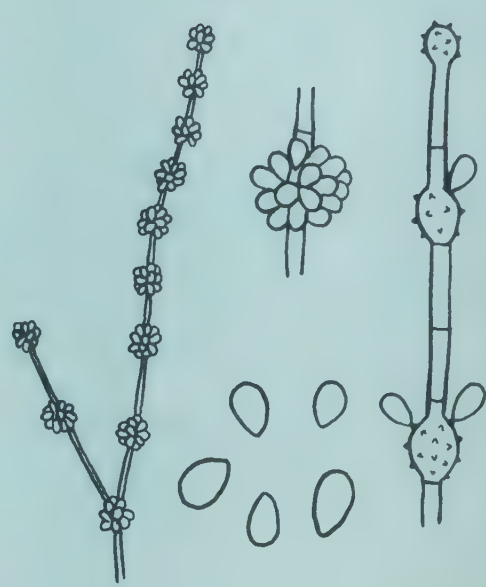
Fig. 68. *M. indicum*; redrawn from Saksena (224).

69. *GLIOCLADIUM* Corda. Conidiophores septate, the upper portion bearing penicillate branches, forming a compact "brush" as in *Penicillium*; conidia hyaline or brightly colored in mass, 1-celled, produced successively apically and collecting in mucilaginous droplets; saprophytic, common in soil. The genus is like *Penicillium* except for the mucilaginous material holding the spore masses. A common species, *G. roseum*, also produces a *Verticillium* stage.

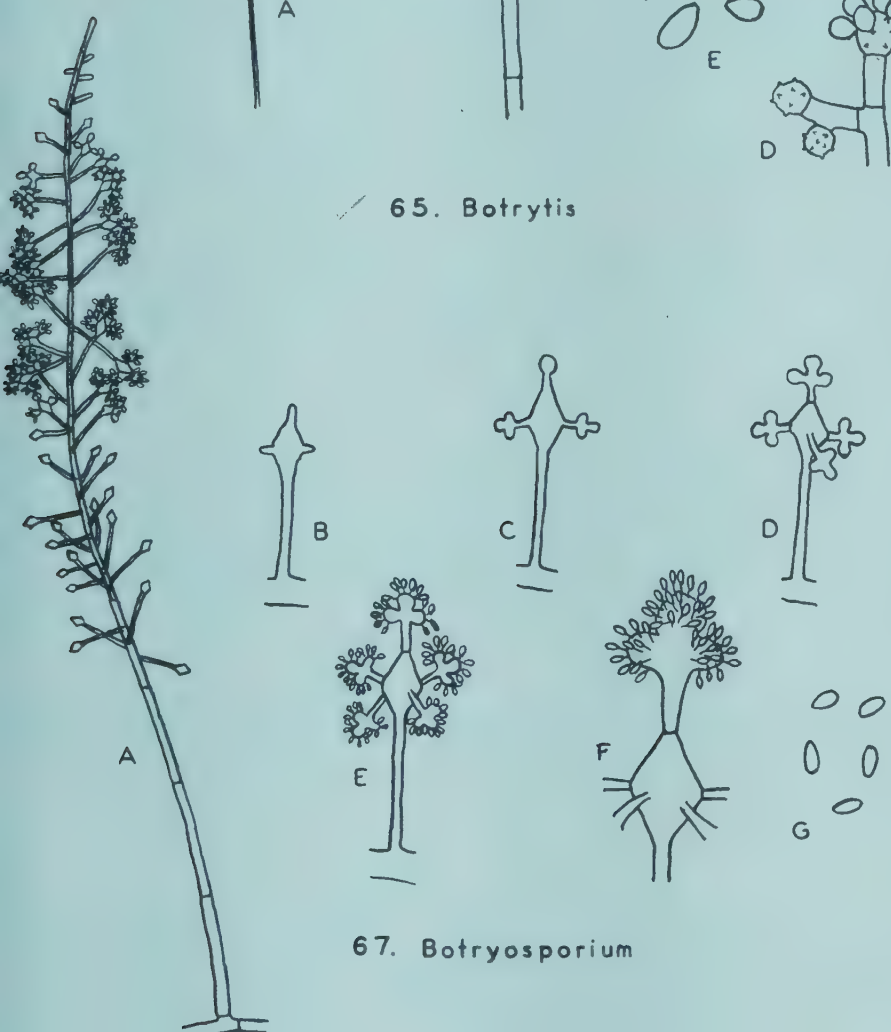
Fig. 69. *G. deliquescens*; original, from culture isolated from soil. A, conidiophores and heads of conidia as seen in dry mount; B, conidiophores and conidia in water. References (218, 236).



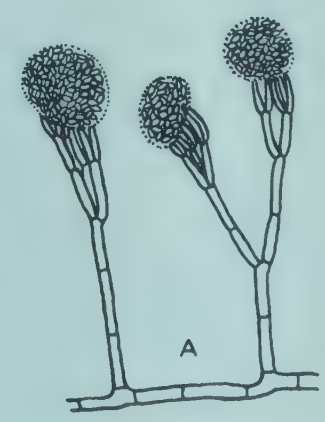
65. Botrytis



66. Gonatobotrys



67. Botryosporium



69. Gliocladium



68. Monocillium

70. *PAECILOMYCES* Bainier. Conidiophores mostly arising from aerial hyphae, sometimes absent; phialides in a loose verticillate group on the conidiophore or arising directly from the mycelium more divergent than in *Penicillium*; basal portion of phialide nearly cylindrical, tapering gradually or abruptly to a long slender tube; conidia produced successively (basipetally) and held together in chains, or in irregular masses under moist conditions, 1-celled, hyaline; saprophytic, growing under a wide variety of conditions. Compare with *Spicaria*.

Fig. 70. *Paecilomyces* sp.; original, from culture. Reference (37, 218).

71. *METARRHIZIUM* Sorok. Conidiophores in low mounds, covered by conidia, erect, branched, closely or loosely grouped, forming a sporulating layer; sporogenous cells (phialides) borne singly, in pairs or in whorls; conidia apical, produced in basipetal chains, compacted into columns, long-ovoid to cylindrical, with rounded ends, 1-celled, olive-green in mass; parasitic on insects, causing the green muscardine disease. Compare with *Myrothecium*.

Fig. 71. *M. anisoplae*; original, from culture. A, sporulating fungus on insect larva; B, aerial, loosely arranged conidiophores; C, compact conidiophores; D, conidia. Reference (208, 239).

72. *BOTRYOTRICHUM* Sacc. and March. Sterile hairs in loose tufts, upright, simple, septate, gray to brown; conidiophores short, irregularly branched, hyaline, bearing a loose cluster of conidia; conidia 1-celled, hyaline, borne singly, globose; saprophytic, frequent in soil. *B. piluliferum* produces, in addition, simple phialides at irregular intervals which bear small, hyaline, 1-celled conidia in chains or in clusters.

Fig. 72. *B. piluliferum*; original, from culture. A, conidiophores with large conidia; B, phialides with small conidia; C, sterile hair. Reference (72).

73. *PENICILLIUM* Link. Conidiophores arising from the mycelium singly or less often in synnemata, branched near the apex to form a brush-like, conidia-bearing apparatus; ending in phialides which pinch off conidia in dry chains; conidia hyaline or brightly colored in mass, 1-celled, mostly globose or ovoid, produced basipetally. A large genus containing both parasitic (producing rots of fleshy plant parts) and saprophytic species.

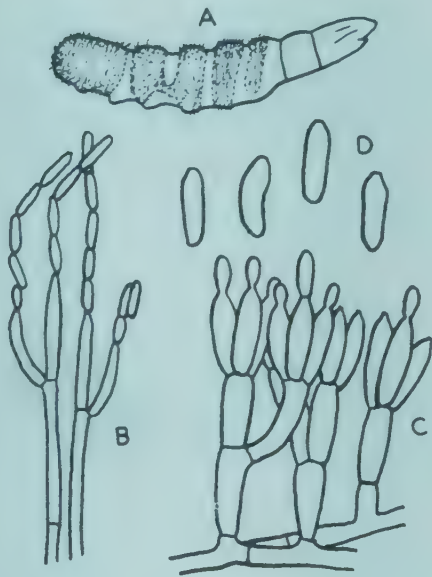
Fig. 73. *Penicillium* sp.; original, from culture. A, B, C, types of conidiophores; D, branches, phialides and chains of conidia. Reference (2).

74. *ASPERGILLUS* Link. Conidiophores upright, simple, terminating in a globose or clavate swelling, bearing phialides at the apex or radiating from the entire surface; conidia 1-celled, globose, often variously colored in mass, catenulate, produced basipetally. A large genus containing many species saprophytic on a wide variety of substrata and a few parasitic species.

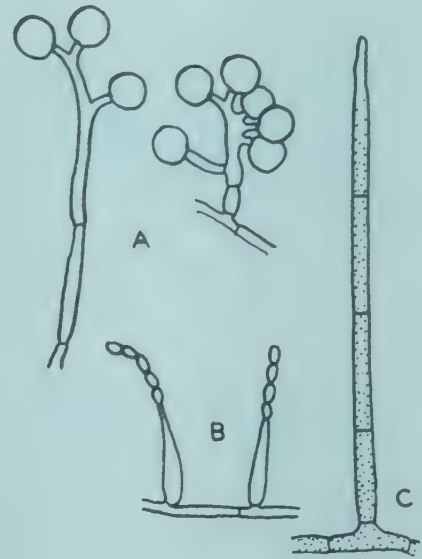
Fig. 74. *Aspergillus* spp.; original, from culture. A, habit sketch; B, C, conidiophores with conidial heads. Reference (282).



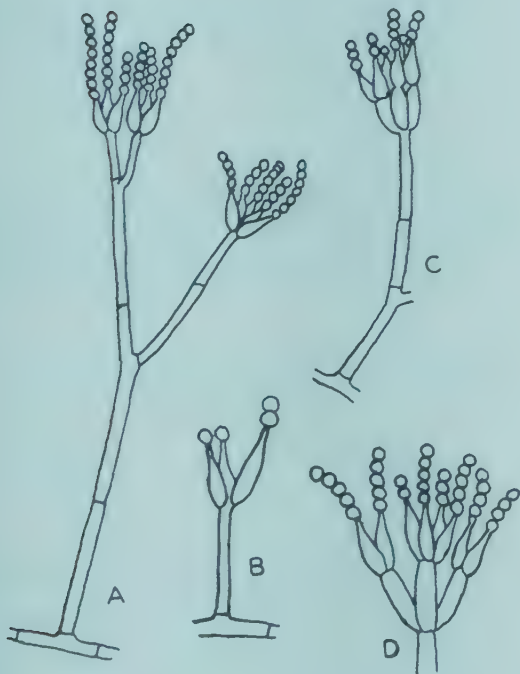
70. *Paecilomyces*



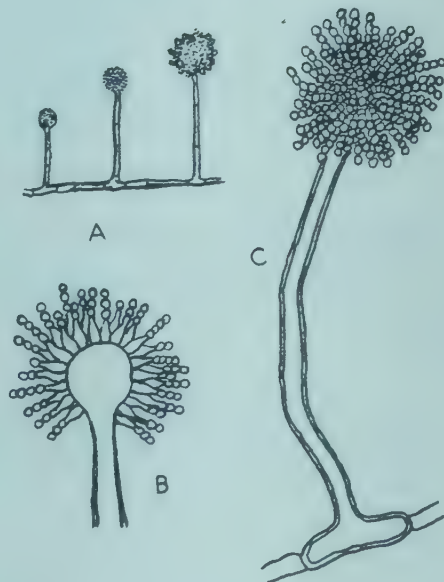
71. *Metarrhizium*



72. *Botryotrichum*



✓ 73. *Penicillium*



74. *Aspergillus*

75. *AMBLYOSPORIUM* Fres. Conidiophores erect, septate, lower portion unbranched, bearing a number of irregular branches near or at the apex, on which conidial chains are borne; conidia 1-celled, hyaline or bright-colored, barrel-shaped, catenulate; saprophytic, from soil.

Fig. 75. *A. botrytes*; original, from culture.

76. *PHYMATOTRICHUM* Bon. Conidiophores rather short, stout, simple or branched, with inflated or lobed tips, bearing loose heads of conidia; conidia hyaline, 1-celled; produced on the surface of soil; spherical, ovoid or oblong; saprophytic or parasitic in soil causing root rots.

Fig. 76. *P. omnivorum*; A, "rope" of hyphae; B, conidiophores and conidia; C, conidia. Redrawn from Street (248).

77. *GONATORRHODIELLA* Thaxt. Conidiophores stout, simple, or branched, septate, with inflated apical and intercalary cells bearing heads of conidia; conidia hyaline, 1-celled, ovoid or ellipsoid, catenulate, young conidia formed acropetally; frequently associated with *Hypocrea*, *Hypomyces*, *Nectria* and other fungi and may be parasitic.

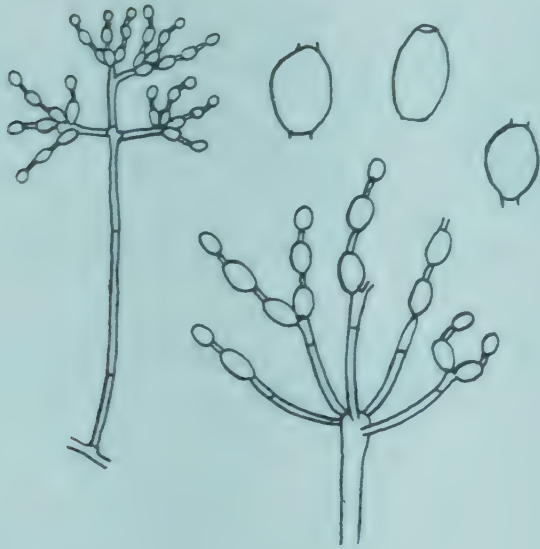
Fig. 77. *G. parasitica* (*Nematogonium parasiticum*); redrawn from Thaxter (277). Other reference (9).

78. *SCOPULARIOPSIS* Bain. Conidiophores branched, the upper portion bearing a cluster of phialides; conidia hyaline, 1-celled, globose with a truncate base, catenulate, produced basipetally as in *Penicillium*; colonies other than green; saprophytic in soil.

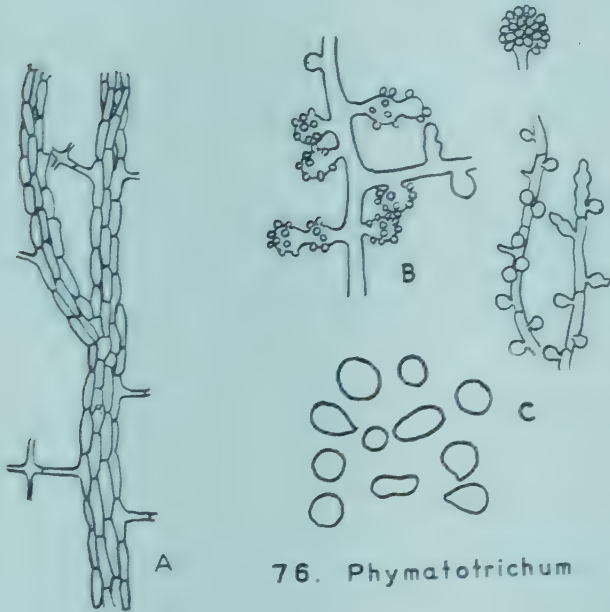
Fig. 78. *Scopulariopsis* sp.; original, from soil. A, conidiophores and conidia; B, phialides. Reference (218).

79. *SPICARIA* Auct. Conidiophores arising singly, frequently branched, terminating in a group of widely divergent phialides; conidia hyaline or somewhat colored in mass, 1-celled, globose, catenulate, produced basipetally, powdery; saprophytic. The genus is much like *Penicillium*, but the spore-bearing apparatus is less compact and the phialides more spreading. Compare with *Paecilomyces*.

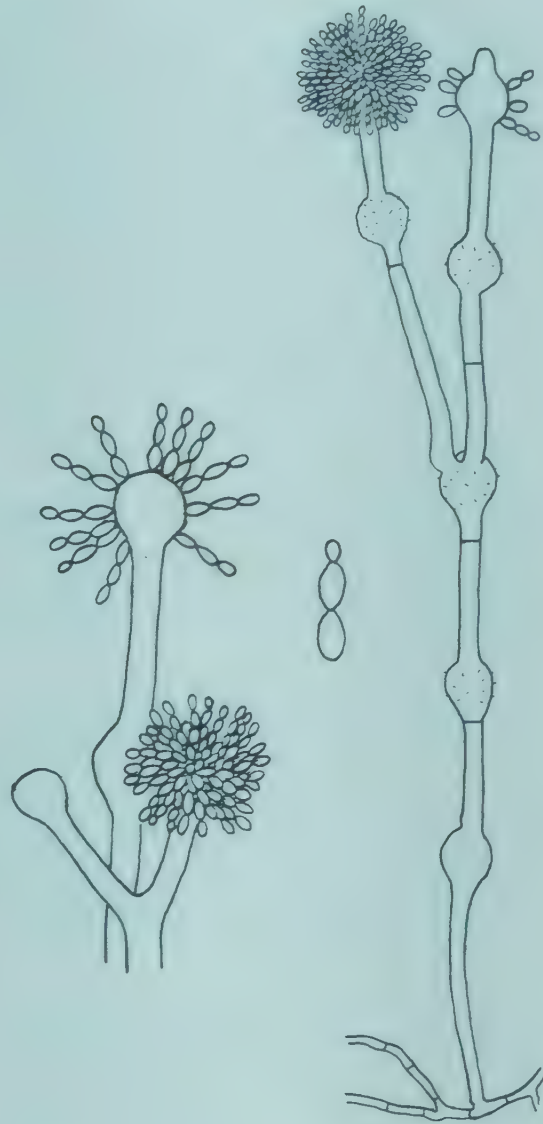
Fig. 79. *Spicaria* sp.; original, from culture. A, habit sketch; B, C, D, conidiophores, phialides and chains of conidia. Reference (218).



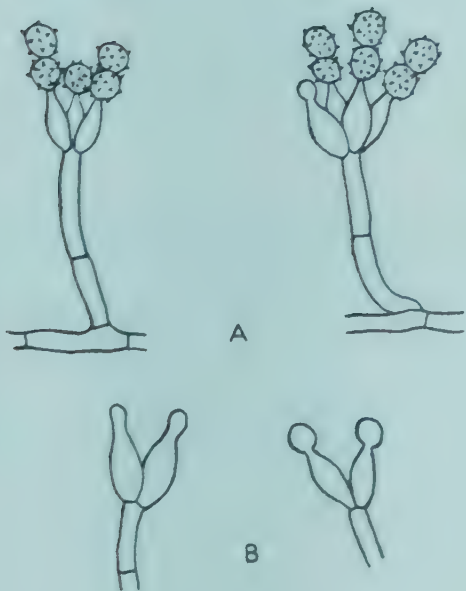
75. *Amblyosporium*



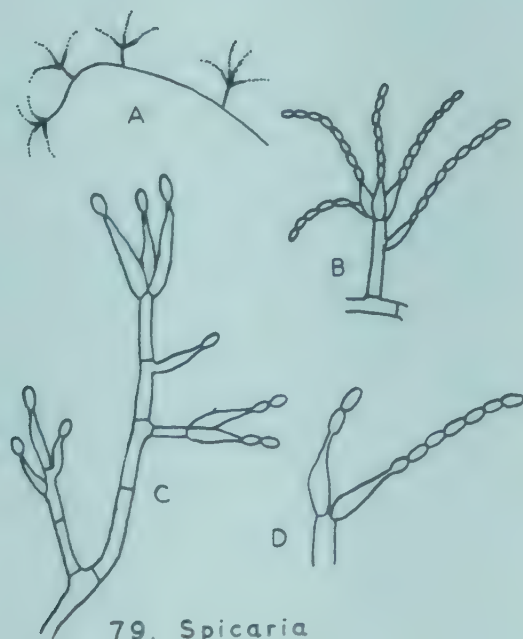
76. *Phymatotrichum*



77. *Gonatorrhodiella*



78. *Scopulariopsis*



79. *Spicaria*

80. **HYALODENDRON** Diddens. Mycelium white; conidiophores erect, variable in length, simple or branched, bearing one to a few conidia at the apex of the branches; conidia frequently in small clusters, becoming catenulate by acropetalous formation of new conidia, chains often branched, 1-celled, hyaline, variable in shape, ovoid to cylindrical or oblong; saprophytic or parasitic, mostly on wood; mostly Moniliaceous stages of species of *Ceratocystis*. This genus is like *Cladosporium* (*Hormodendrum*) except for lack of pigmentation.

Fig. 80. A, *H. pirinum* (conidial stage of *Ophiostoma catonianum*); redrawn from Goidanich (110); B, C, *Hyalodendron* sp.; original from culture.

81. **ARTHROBOTRYS** Corda. Conidiophores elongated, slender, simple, septate, slightly inflated at the apex and typically at "joints" below the apex; conidia hyaline, unequally 2-celled, ovate-oblong, borne on warts or sterigmata on slightly enlarged portions of conidiophore in loose clusters; saprophytic, or some species parasitic on nematodes.

Fig. 81. *Arthrobotrys oligospora*; original, from culture isolated from decayed wood. Reference (78).

82. **TRICHOTHECIUM** Link. Conidiophores long, slender, simple, septate, bearing conidia singly, apically, sometimes held together in groups or chains, not end to end; conidia hyaline or brightly colored, 2-celled, ovoid to ellipsoid; saprophytic or weakly parasitic.

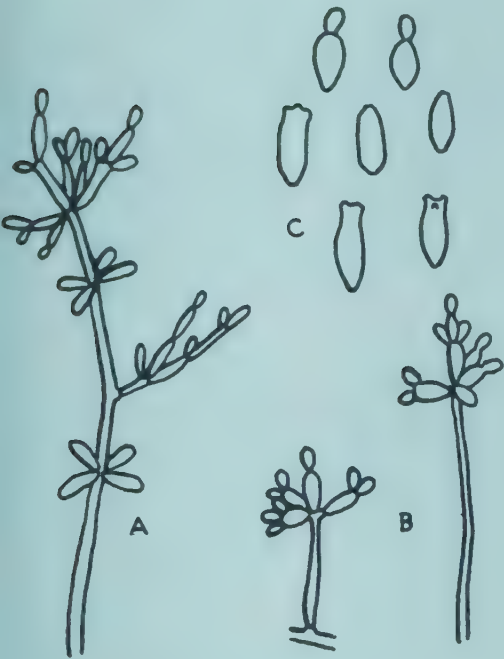
Fig. 82. *T. roseum*; original, from culture.

83. **HELISCUS** Sacc. Submerged, aquatic, with branched, septate mycelium; conidiophores simple or sparingly branched, bearing one or more phialides; submerged conidia hyaline, 2-celled, broader at the apex, usually bearing 3 short apical protuberances; saprophytic, aquatic.

Fig. 83. *H. aquaticus*; redrawn from Ranzoni (216).

84. **CYLINDROCLADIUM** Morgan. Conidiophores regularly and repeatedly dichotomous or trichotomously branched, each terminating in two or three phialides; conidia hyaline, 2-celled (sometimes 4-celled), cylindrical, borne singly; parasitic or saprophytic.

Fig. 84. *C. scoparium*; original, from pure culture. Reference (35).



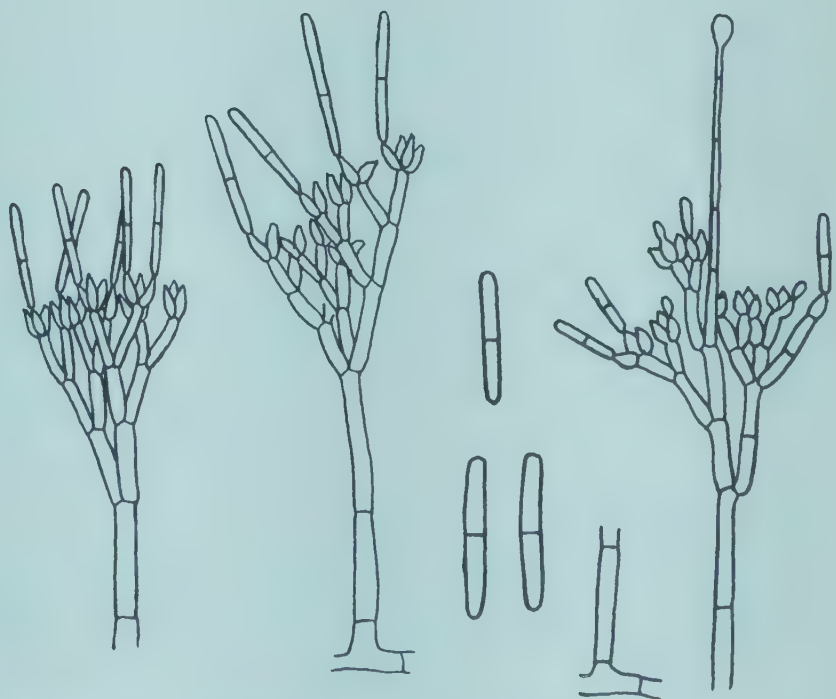
80. *Hyalodendron*



81. *Arthrobotrys*



82. *Trichothecium*



84. *Cylindrocladium*



83. *Heliscus*

85. **DIDYMOCLADIUM** Sacc. Mycelium floccose, growing rapidly; conidiophores erect, arising from aerial hyphae, branches irregular, opposite or in whorls, hyaline, end branches frequently producing 3 phialides; conidia 2-celled, hyaline, produced successively at the apex and hanging together in irregular or tangled chains; chlamydospores mostly submerged in the medium, on short branches, sessile, or intercalary, thick-walled, 1-few cells together; on fleshy fungi; similar to *Diplocladium* except producing conidia in chains.

Fig. 85. *D. ternatum*; original, from culture; A, conidiophores; B, conidia; C, chlamydospore.

86. **DIPLOCLADIUM** Bon. Conidiophores large, verticillately or irregularly repeatedly branched, terminating in a group of phialides; conidia hyaline or slightly colored, 2-celled, ovoid to oblong, usually borne singly on the phialides; parasitic on fruit bodies of higher fungi, imperfect state of certain *Hypomyces*.

Fig. 86. *D. minus*; original, from herbarium material on *Polyporus*.

87. **DIDYMARIA** Corda. Conidiophores arising from leaf surface in loose groups, simple; conidia hyaline, 2-celled, oblong, borne singly; parasitic on leaves. See Hughes (153) for synonymy with *Ramularia* Unger.

Fig. 87. *D. conferta*; original, from herbarium material. A, conidiophores on surface of leaf; B, group of conidiophores; C, conidia.

88. **DIPLORHINOTRICHUM** Hohn. Conidiophores erect, straight or bent, usually single, non-septate or with a basal septum, hyaline, the upper half bearing numerous conidia on conspicuous teeth, conidia 2-celled, hyaline, dry, fusoid to cylindrical; saprophytic.

Fig. 88. *D. candidum*; redrawn from Hughes (134).

89. **RHYNCHOSPORIUM** Heinsen. Mycelium sub-cuticular at first, later developing into a superficial, loose stroma; conidiophores reduced to cells of stroma; conidia hyaline, 2-celled, frequently unequal, and often with a short lateral beak on the apical cell; parasitic, producing leaf spots, chiefly on grasses.

Fig. 89. *R. secalis*; original, from leaf spot on rye. Reference (43).

90. **DIPLOSPORIUM** Link. Conidiophores erect, well developed, septate, irregularly branched, ultimate branches (phialides) tapering upward, hyaline; conidia produced successively at the apex and held together in loose clusters, not catenulate, 2-celled, hyaline; saprophytic. See Hughes (153) for synonymy with *Oedemium* Link.

Fig. 90. *D. flavum*; redrawn from Tubaki (288).

91. **RAMULARIA** Sacc. Conidiophores growing out through stomata of host leaves, clustered, short, hyaline or subhyaline; simple, frequently curved or bent, with prominent conidial scars; conidia hyaline, cylindrical, typically 2-celled, but many 1-celled and a few 3-celled, frequently in short chains; parasitic on plants, causing leaf spots.

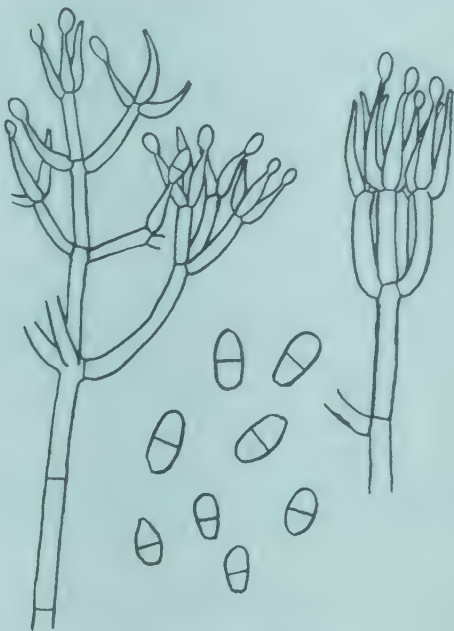
Fig. 91. *R. tulasnea* (*Mycosphaerella fragariae*); original, from herbarium material on strawberry leaf. A, habit on leaflet; B, conidiophores; C, conidia.

92. **DENDROSPORIUM** Plakidas and Edgerton. Conidiophores similar to vegetative hyphae, variable in length, septate, often branched, bearing a few conidia near the apex; conidia hyaline, 2-celled, deeply constricted, with a short pedicel; saprophytic on bark.

Fig. 92. *D. lobatum*; drawn from photographs by Plakidas and Edgerton (211).



85. *Didymocladium*



86. *Diplocladium*



A

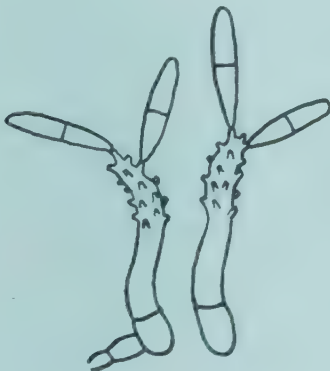


B



C

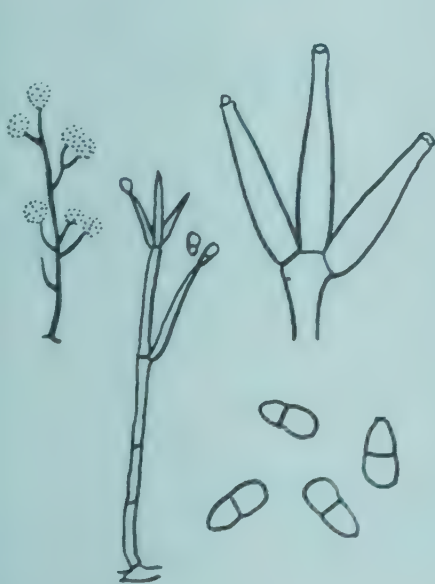
87. *Didymaria*



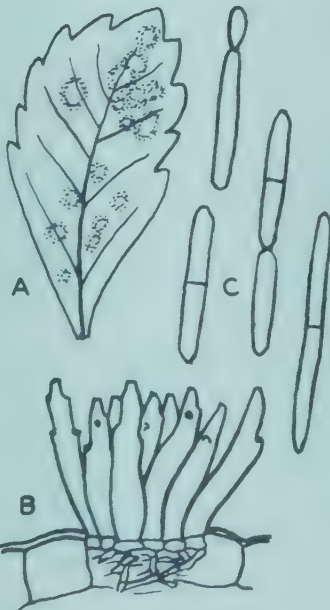
88. *Diplorhinotrichum*



89. *Rhynchosporium*



90. *Diplosporium*



91. *Ramularia*



92. *Dendrosporium*

93. GLIOCLADIOPSIS Saksena. Conidiophores erect, septate, branched, ending in definite penicillate heads, usually consisting of primary branches, secondary branches and phialides; conidia 2-celled, hyaline slender, cylindrical, produced in succession and becoming aggregated into slimy masses at the apex of the conidiophore; saprophytic from soil.

Fig. 93. *G. sagariensis*; redrawn from Saksena (223).

94. PIRICULARIA Sacc. Conidiophores long, slender, simple or rarely branched, septate, single or in tufts; conidia pyriform to nearly ellipsoid, borne singly and attached at the broader end; hyaline, 2-3 celled; parasitic, chiefly on grasses.

Fig. 94. A, *P. oryzae*; original, from culture; B, *P. grisea*, original, from leaf of *Setaria*.

95. MASTIGOSPORIUM Riess. Conidiophores hyaline, short, simple, 1-celled; conidia with 4 or more cells, with or without apical appendages; broadly cylindrical, with rounded to pointed ends; parasitic on grasses, causing leaf spots.

Fig. 95. A, *M. rubricosum* (*M. calvum*); B, *M. album*. Redrawn from Sprague (240). Other reference (127).

96. MOESZIA Bubak. Conidiophores erect, slender, septate, irregularly branched, bearing apical phialides, apex of phialide showing a conspicuous collarette; conidia produced successively at apex and aggregating into small cylindrical fascicles, mostly 3-celled, hyaline, cylindrical; saprophytic.

Fig. 96. *M. cylindroides*; redrawn from Tubaki (288).

97. DACTYLARIA Sacc. Conidiophores slender, simple, septate, bearing a terminal radiating group of several conidia; conidia hyaline, 3- or more-celled, variable in shape; saprophytic in decaying plant material or parasitic on nematodes.

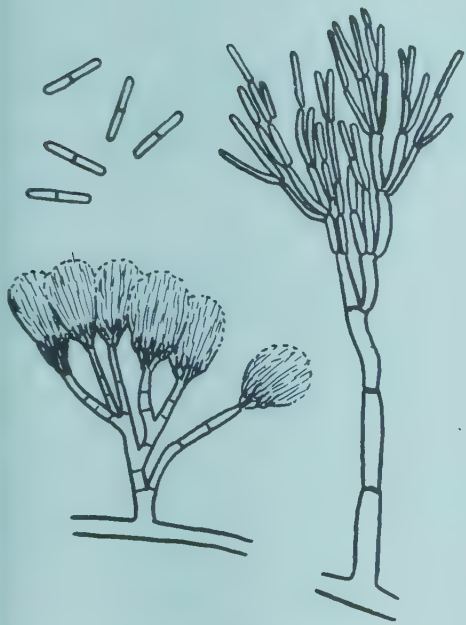
Fig. 97. *D. brochophaga*; A, conidia and conidiophores; B, constricting rings which capture nematodes. Redrawn from Drechsler (78).

98. HYALOFLOREAE Batista and Maia. Conidiophores erect, septate, hyaline, simple or sparingly branched, with apical or intercalary 2- or 3-lobed vesicles; conidia borne successively at the apex and forming loose clusters in mucus, cylindrical, mostly 4-celled when mature, hyaline; saprophytic, obtained from the air.

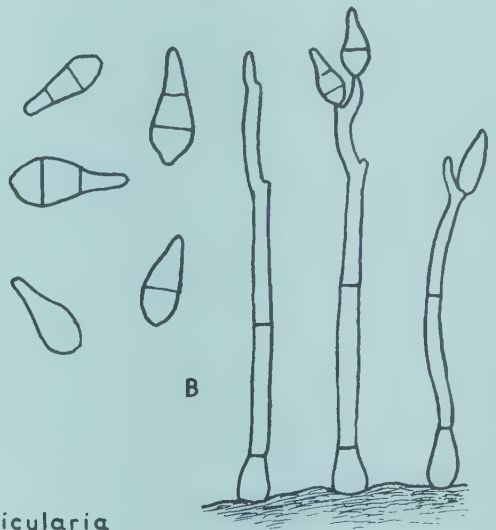
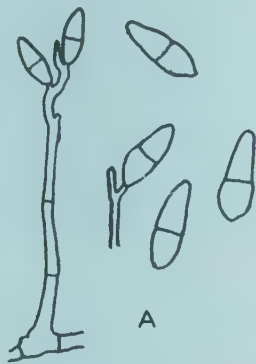
Fig. 98. *H. ramosa*; original from culture. Reference (19).

99. EURICOA Batista and Maia. Conidiophores erect, septate, producing conidia of two types, globose, spiny cells in small clusters and cylindrical to fusoid conidia borne apically, the latter 3- to several-celled, hyaline to subhyaline; saprophytic, from the air.

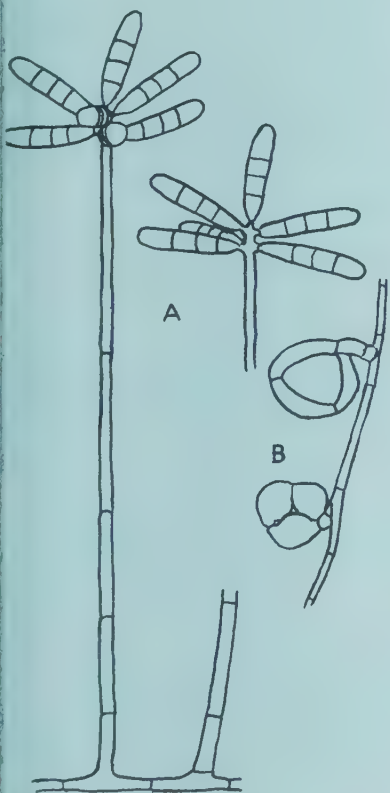
Fig. 99. *E. dominguesii*; redrawn from Batista and Maia (19).



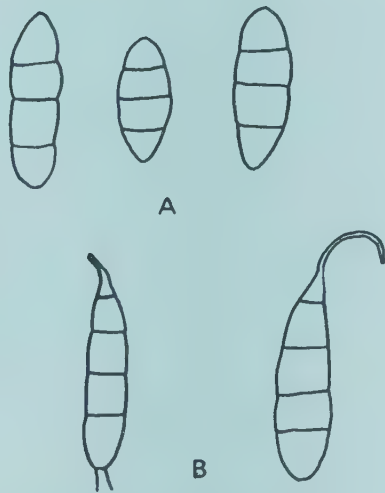
93. *Gliocladiopsis*



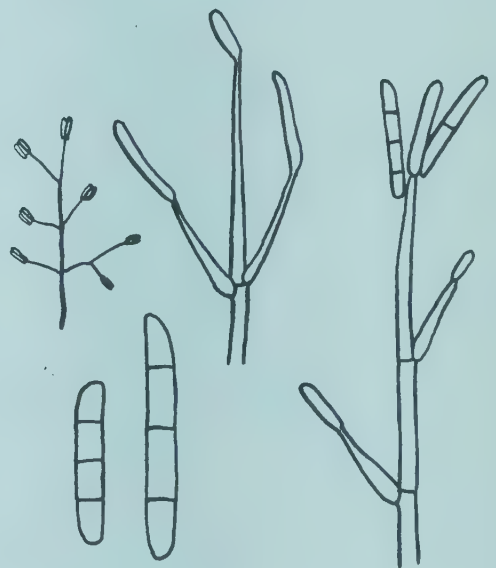
94. *Piricularia*



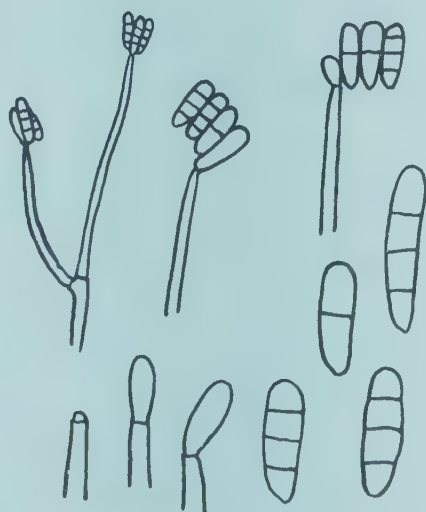
97. *Dactylaria*



95. *Mastigosporium*



96. *Moeszia*



98. *Hyaloflora*



99. *Euricoa*

100. *FUSARIUM* link. Mycelium extensive and cottony in culture, often with some tinge of pink, purple or yellow, in the mycelium or medium; conidiophores variable, slender and simple, or stout, short, branched irregularly or bearing a whorl of phialides single or grouped into sporodochia; conidia hyaline, variable, principally of two kinds often held in a mass of gelatinous material; macroconidia several-celled slightly curved or bent at the pointed ends, typically canoe-shaped; microconidia 1-celled, ovoid or oblong, borne singly or in chains; some conidia intermediate, 2- or 3-celled, oblong or slightly curved; parasitic on higher plants or saprophytic on decaying plant material. A large and variable genus, sometimes placed in the *Tuberulariaceae* because some species produce sporodochia.

Fig. 100. *Fusarium* spp.; original, from culture. A, hyphae with simple conidiophores; B, variable conidiophores; C, a loose sporodochium formed by branched conidiophores; D, conidia. Reference (106, 233).

101. *SEPTOCYLINDRIUM* Bon. Conidiophores hyaline, short and simple, or longer branched; conidia hyaline, 2- to several-celled; oblong to cylindrical, catenulate, the chains sometimes branched; parasitic on higher plants or saprophytic on plant material. The genus is similar to *Ramularia* but the spores usually have more cells.

Fig. 101. *S. aromaticum*; original, from herbarium material on leaves of *Acorus calamus*.

102. *DACTYLIUM* Nees. Conidiophores slender, branched verticillately; conidia usually borne singly, apical on branches of conidiophore, hyaline, 3- or more-celled; saprophytic or parasitic on fleshy fungi; conidial stage of *Hypomyces*.

Fig. 102. *D. dendroides*; original, from culture.

103. *SPERMOSPORA* Sprague. Conidiophores hyaline or nearly so, short, grouped; conidia hyaline, subulate to narrow subulate, with distal cell elongated, attenuated, appendage-like, several-celled; parasitic on grasses, causing leaf spots. Similar to *Cercospora* but differs in the apical appendage of the conidium.

Fig. 103. *S. avenae*; original, from culture. A, conidiophore and conidia; B, conidia. References (242, 244).

104. *FUSOMA* Corda. Mycelium sparse; conidiophores short, each bearing a single apical conidium; conidia hyaline, several-celled, fusoid to cylindrical; parasitic on higher plants. Some species are similar to *Fusarium*.

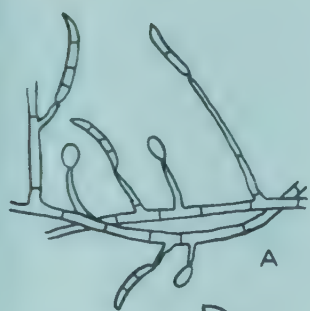
Fig. 104. *F. rubricosa*; original, from herbarium material of leaves of *Calamagrostis scabra*. A, conidiophores and immature conidia; B, conidiophores and mature conidia.

105. *MICROSPORUM* Gruby. Mycelium white to tan in culture; conidiophores rather short, slender, simple, bearing apically a single, large macroconidium; macroconidia fusoid, several-celled, hyaline; microconidia also formed on sides of hyphae; causing dermatomycoses of animals and man.

Fig. 105. *M. gypseum*; original, from culture. A, hyphae, conidiophores and conidia; B, stages in development and separation of conidium. Reference (54).

106. *CERCOSPORELIA* Sac. Conidiophores hyaline, slender, simple or branched; bearing single conidia apically or on short branches; conidia hyaline, several-celled, oblong cylindrical to filiform, straight or curved; parasitic on higher plants; differs from *Cercospora* in that both conidiophores and conidia are hyaline.

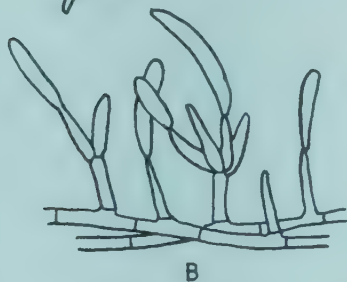
Fig. 106. *C. persica*; original, from herbarium material on peach leaf.



A



C



B



D

100. *Fusarium*



101. *Septocylindrium*



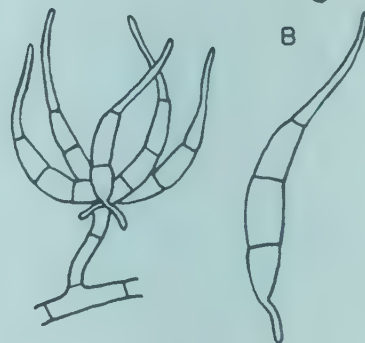
102. *Dactylium*



A



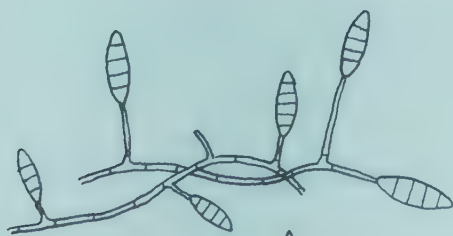
B



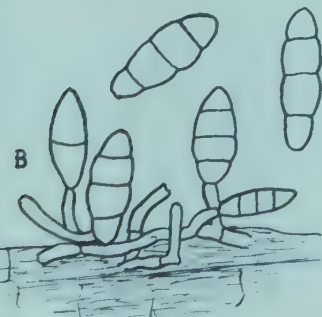
103. *Spermospora*



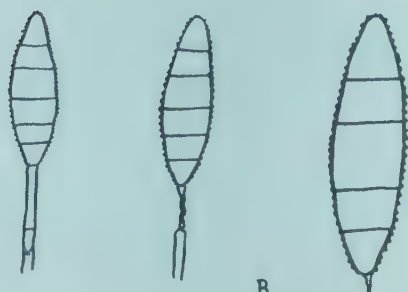
A



A

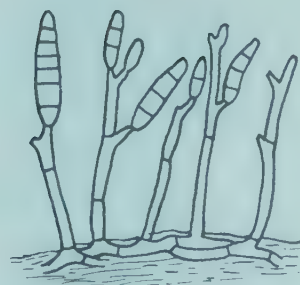


B



B

105. *Microsporum*



106. *Cercospora*

104. *Fusoma*

107. **MARGARITISPORA** Ingold. Mycelium aquatic, septate, branched; conidiophores branched at upper portion, similar to *Penicillium*; conidia apical, produced successively, but not forming chains; submerged conidia tetrahedral to subspherical, 1-celled, hyaline; conidia produced above surface of water elongated, often slightly curved, becoming 3-celled, hyaline; aquatic, saprophytic.

Fig. 107. *M. erecta*; redrawn from Ingold (157). A, submerged conidiophore and conidia; B, conidiophore and aerial conidia.

108. **TRICHOPHYTON** Malmsten. Mycelium cottony, granular or powdery in culture, white or with variable pigmentation; microconidia hyaline, small, 1-celled, subspherical or ovoid, borne on sides of hyphae, single or in clusters; macroconidia large, several celled, thin-walled, hyaline, clavate; causing dermatomycoses in man. Spores may be formed only in old cultures on certain media.

Fig. 108. *T. violaceum*; A, microconidia; B, macroconidia. Redrawn from Georg (102). Other references (103, 104).

109. **DACTYLELLA** Grove. Conidiophore slender, simple or sparingly branched, septate, producing a single apical conidium; conidia hyaline, 3- or more-celled, variable in shape; saprophytic in decaying vegetable matter or parasitic on nematodes.

Fig. 109. A, B, *D. ellipsospora*; A, conidiophore and conidia, B, adhesive globose cells which hold nematodes; C, D, *D. leptospora*, C, conidiophores and conidia; D, non-constricting hyphal rings which hold nematodes. All redrawn from Drechsler (78).

110. **FLAGELLOSPORA** Ingold. Conidiophores long, slender, septate, branched above, ending in phialides which bear single conidia; conidia hyaline, 1- or more-celled, flagelliform, slender, curved; saprophytic on submerged decaying leaves.

Fig. 110. *F. penicillioides*; redrawn from Ingold (159). Other reference (216).

111. **LUNULOSPORA** Ingold. Conidiophores long, slender, hyaline, branched near the apex, the branches bearing single conidia; conidia hyaline, 1-celled, elongate to filiform, bent, typically lunate; saprophytic on submerged leaves.

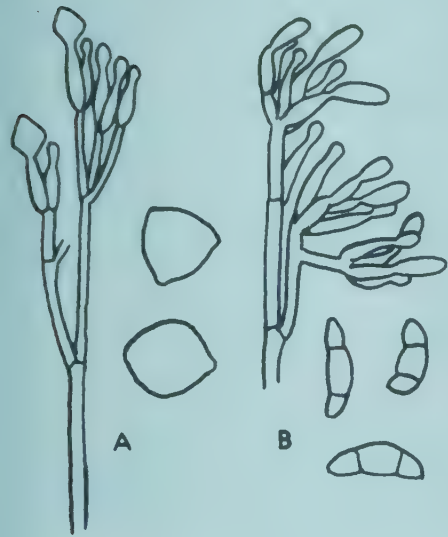
Fig. 111. *L. curvula*; redrawn from Ingold (157). Other reference (216).

112. **TRINACRIUM** Riess. Conidiophores short, slender; conidia hyaline, several-septate unbranched and long-spindle-shaped, or with one to 4 widely divergent branches near the upper portion; on decaying vegetable material and parasitic on oospores of *Pythium*.

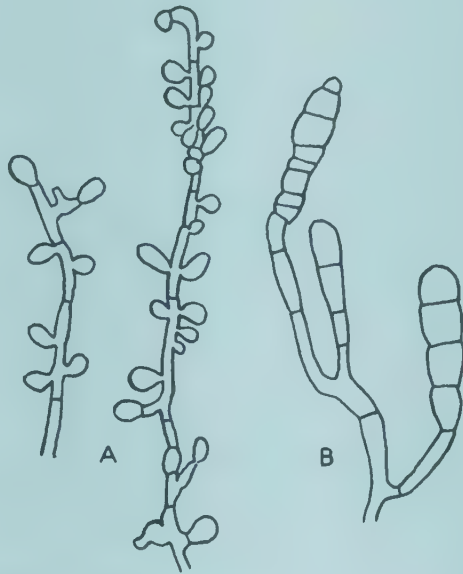
Fig. 112. *T. subtile*; redrawn from Drechsler (80).

113. **DICRANIDION** Hark. (*Pedilospora* Hohn). Conidiophores straight or zig-zag, slender, simple or sparingly branched, hyaline; conidia bilobate-forked, lobes parallel, usually 5-celled produced apically and laterally, hyaline; saprophytic.

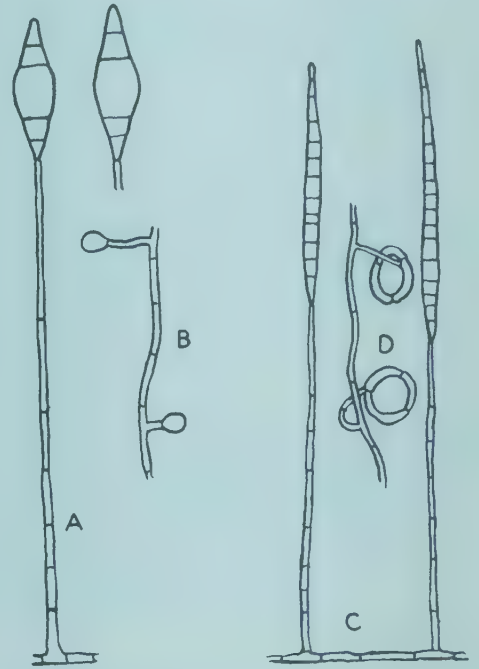
Fig. 113. *D. fragile*; redrawn from Tubaki (288). Other reference (74).



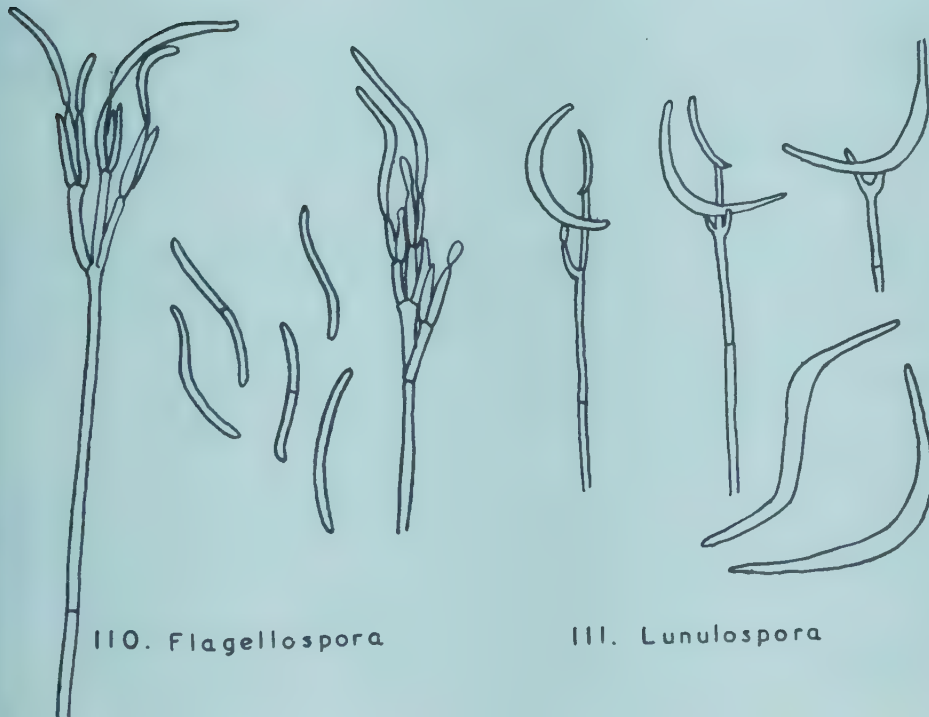
107. *Margaritispora*



108. *Trichophyton*

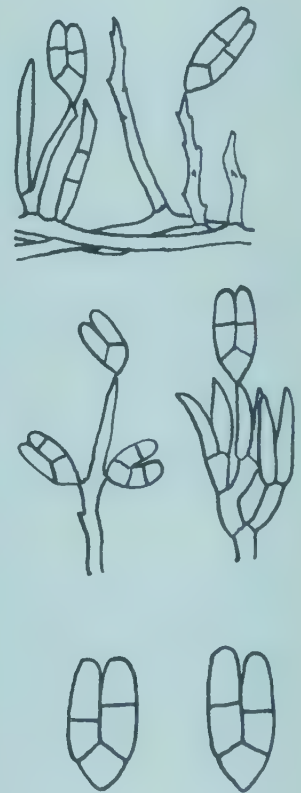


109. *Dactylella*

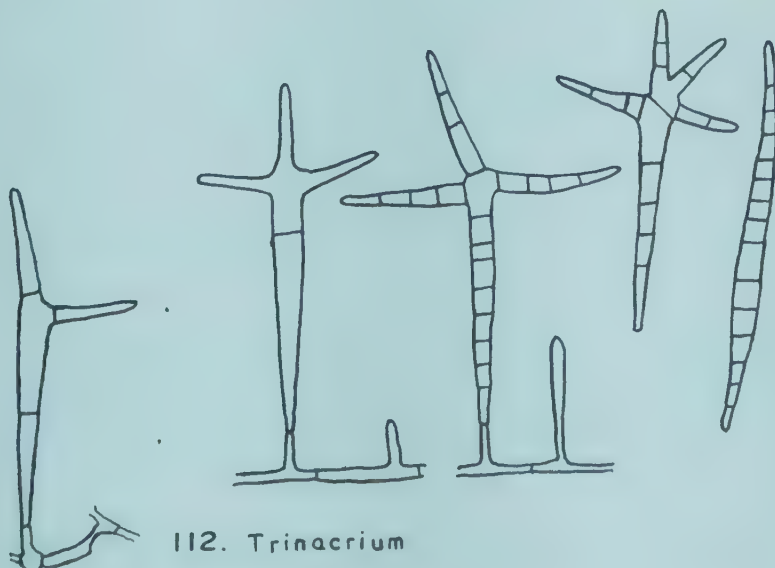


110. *Flagellospora*

111. *Lunulospora*



113. *Dicranidion*



112. *Trinacrium*

114. LEMONNIERA De Wild. Conidiophores hyaline, slender, branched; conidia hyaline, ultimately septate, with 4 slender widely divergent prongs; saprophytic on submerged decaying leaves.

Fig. 114. *L. aquatica*; redrawn from Ingold (157). Other reference (216).

115. CAMPYLOSPORA Ranzoni. Submerged, aquatic, with branched, septate mycelium; conidia septate, hyaline, asymmetric, consisting of a basal cell with two divergent appendages and a lateral branch with divergent appendages.

Fig. 115. *C. chaetoclada*; redrawn from Ranzoni (216).

116. ANGUILLOSPORA Ingold. Submerged, aquatic, with branched, septate mycelium; conidia terminal, eel-like, several-celled, hyaline, separating from the conidiophore by the breakdown of a special separating cell at the apex; saprophytic.

Fig. 116. *A. longissima*; redrawn from Ingold (157). Other reference (216).

117. TRICLADIUM Ingold. Conidiophores hyaline, long, slender, branched; conidia hyaline, several-celled, curved, cylindrical, branched, the two branches usually arising from adjacent cells; saprophytic on submerged decaying leaves.

Fig. 117. *T. splendens*; redrawn from Ingold (157). Other reference (216).

118. DICTYOARTHROSPORA Batista and Ciferri. Mycelium superficial, hyaline; conidiophores very short or obsolete; conidia hyaline, somewhat squared, compressed, 4- to 24-celled, flat, with double membrane, smooth, sessile or nearly so; on leaves.

Fig. 118. *D. costaricensis*; redrawn from Batista and Ciferri (16).

119. VARICOSPORIUM Kegel. No sharp distinction between conidiophores and conidia, conidiophores simple or sparingly branched near the apex, bearing conidia apically; conidium consisting of a main elongated axis with 2 or 3 laterals on one side; each lateral is septate and branched again, hyaline; saprophytic, aquatic or in soil.

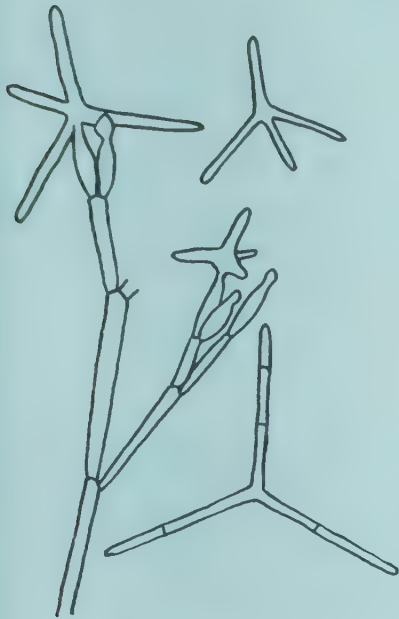
Fig. 119. *V. elodeae*; redrawn from Ingold (157). Other reference (274).

120. CLAVARIOPSIS De Wild. Conidiophore long, slender, hyaline, simple; conidia hyaline, apical, single, branched, main axis broadly clavate to pyriform, 2-celled, the three branches from the upper cell widely divergent at angles of about 120°; saprophytic on submerged decaying leaves.

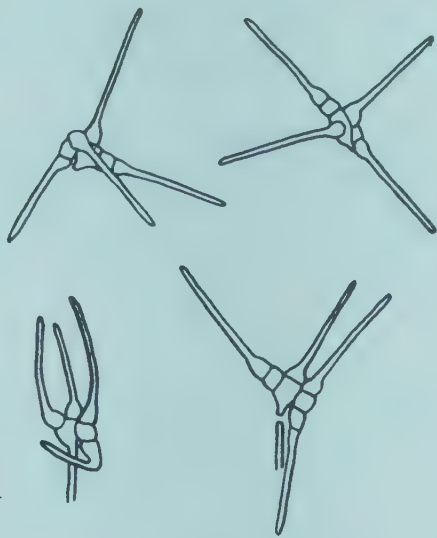
Fig. 120. *C. aquatica*; redrawn from Tubaki (287). Other reference (157).

121. TETRACLADIUM De Wild. Conidiophores hyaline, slender, septate, branched in upper portion; conidia hyaline, branched, the main axis narrowly clavate, finally septate, giving rise to three unequal, divergent tapering branches with a knob or thick finger-like process on the upper side of the first two branches, saprophytic on submerged decaying leaves.

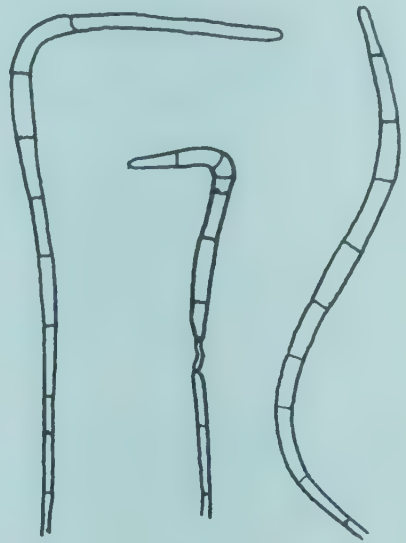
Fig. 121. *T. setigerum*; redrawn from Tubaki (287). Other reference (157).



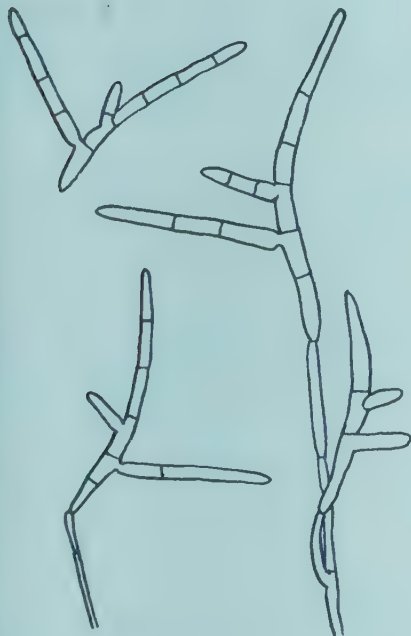
114. *Lemniera*



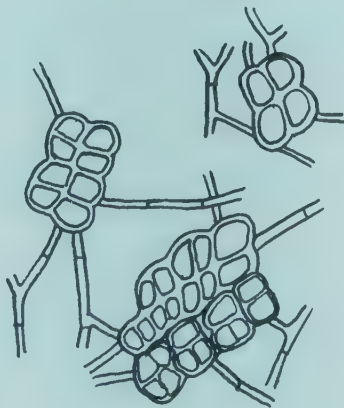
115. *Campylospora*



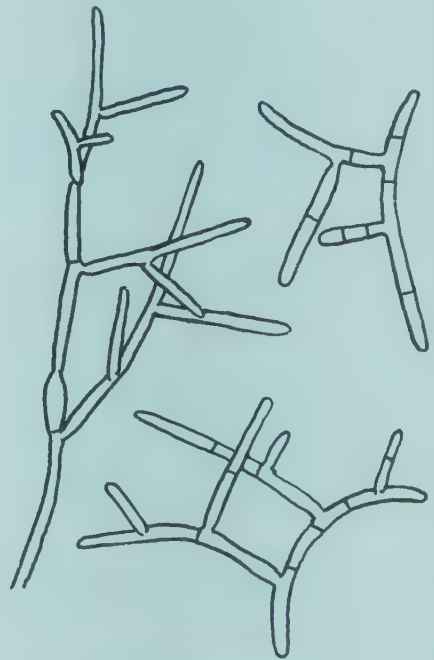
116. *Anguillospora*



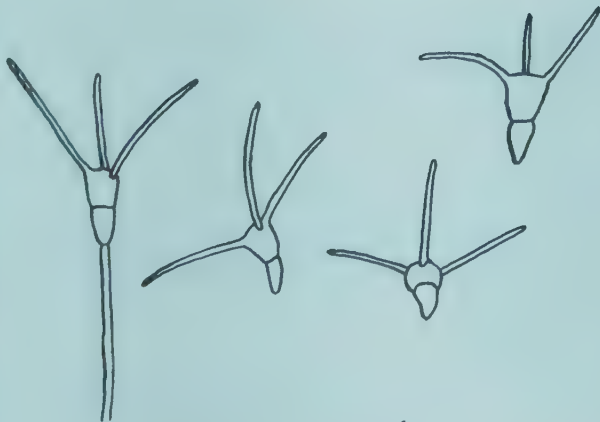
117. *Tricladium*



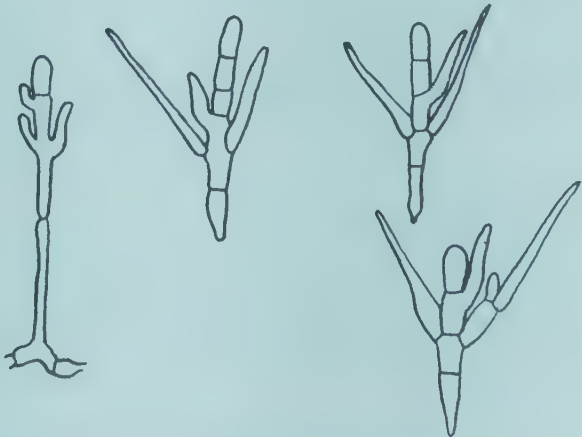
118. *Dictyoarthrinopsis*



119. *Varicosporium*



120. *Clavariopsis*



121. *Tetracladium*

122. TRIDENTARIA Preuss. Conidiophores hyaline, long, slender, simple, septate, bearing a single conidium apically; conidia hyaline, trifurcate, rarely 2- or 4-pronged, the basal cell obconical, septate, prongs septate, tapering upward, slightly divergent; parasitic on nematodes or soil rhizopods, or saprophytic on decayed wood.

Fig. 122. *T. implicans*; original, from culture isolated from decayed wood. A, conidiophores and conidia showing tightly closed prongs as seen in a dry mount; B, conidiophores and conidium as seen in water mount; C, two mature conidia and one very young conidium. Reference (79, 82).

123. ALATOSPORA Ingold. Submerged, aquatic, with branched, septate mycelium; conidiophore simple or branched near the apex; conidia branched, consisting of 4 arms diverging from a common point; the spore consisting essentially of a curved main axis (forming 2 arms) and 2 laterals inserted about the middle of the main axis, apical on the conidiophore, hyaline; saprophytic, on submerged leaves.

Fig. 123. *A. acuminata*; redrawn from Tubaki (287). Other reference (216).

124. ARTICULOSPORA Ingold. Conidiophores hyaline, slender, upper part sparingly branched; conidia hyaline, branched, septate, slender, the three branches slender and about the same diameter as the main axis; saprophytic on decaying submerged leaves.

Fig. 124. *A. inflata*; redrawn from Ingold (159). Other reference (216).

125. ACTINOSPORA Ingold. Conidiophore hyaline, slender, septate, upper portion dichotomously branched forming apical conidia singly; conidia hyaline, branched, the main body globose or ovoid, with 4 or 5 slender, radiating, septate branches; saprophytic on submerged twigs.

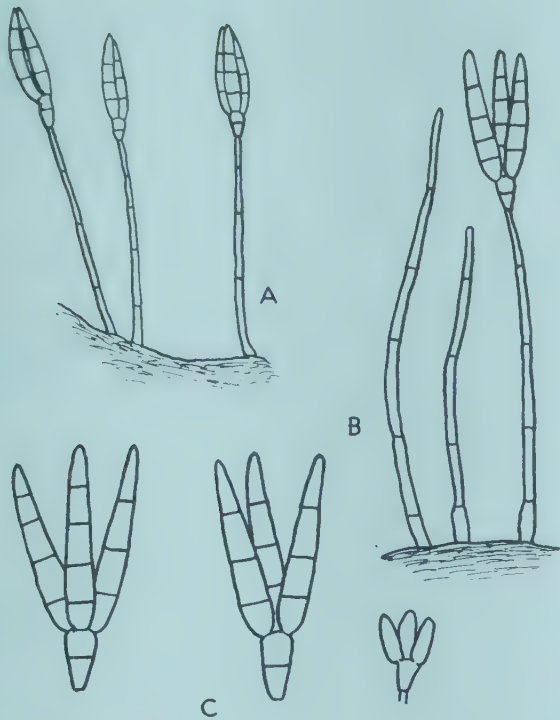
Fig. 125. *A. megalospora*; redrawn from Ingold (160).

126. TRIPOSPORINA Hohn. Conidiophore long, slender, hyaline, septate, sometimes branched; conidia borne singly, hyaline, inversely pyramidal, the lower part septate and tapering to the conidiophore, the broad upper portion with four 1- to 2-celled short, conical arms; parasitic on nematodes.

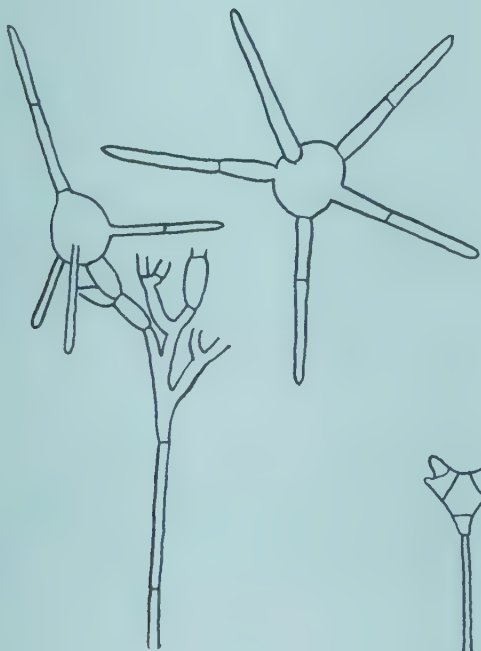
Fig. 126. *T. aphanopaga*; A, conidiophores and conidia; B, mycelium parasitizing nematode. Redrawn from Drechsler (78).

127. THALLOSPORA Olive. No well developed conidiophores present; conidia developing as direct outgrowths from branching hyphae, slender, dichotomously branched, many-celled, hyaline, produced in a white mass inside the ovary of the host; systemic parasite on higher plants (*Veronica peregrina*).

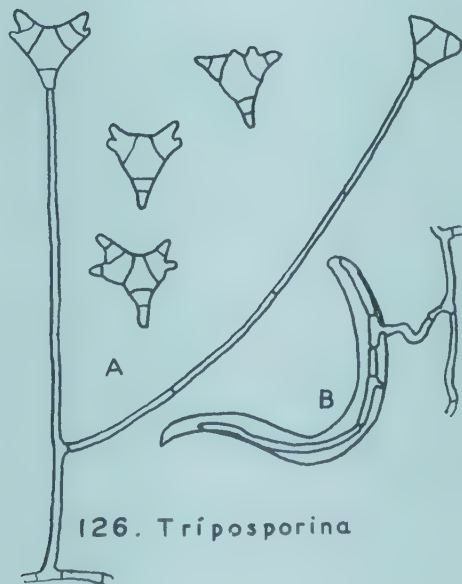
Fig. 127. *T. aspera*; A, B, conidia; C, D, conidia developing from hyphae. Redrawn from Olive (205).



122. *Tridentaria*



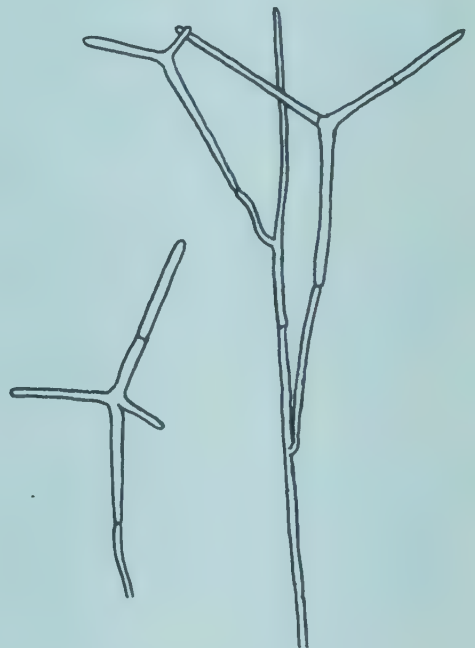
125. *Actinospora*



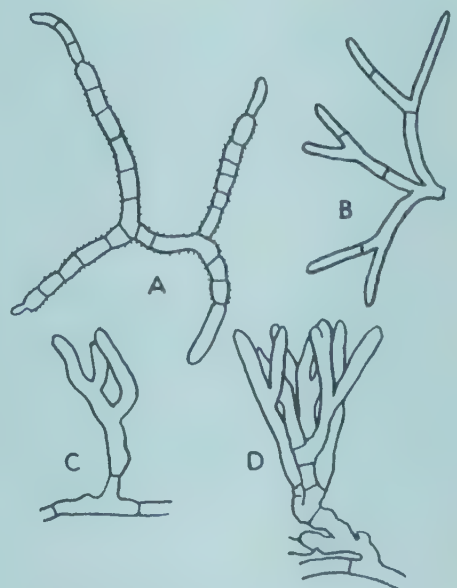
126. *Triposporina*



123. *Alatospora*



124. *Articulospora*



127. *Thallospora*

128. *DENDROSPORA* Ingold. Submerged, aquatic, with branched, septate mycelium; conidiophores simple, slender, hyaline; conidia terminal, branched, several-celled, each consisting of one main axis with several secondary and tertiary branches, hyaline; saprophytic, on decaying leaves in water.

Fig. 128. *D. erecta*; redrawn from Tubaki (287).

129. *TETRACHAETUM* Ingold. Submerged, aquatic with septate mycelium; conidiophores simple or sparingly branched, slender; conidia apical, consisting of 4 long branches diverging from a common point, with one branch of the spore (before liberation) continuous with the conidiophore; spores produced under water, liberated by the break-down of a special short separating cell, hyaline, several cells.

Fig. 129. *T. elegans*; redrawn from Ingold (157). Other reference (216).

130. *CANDELABRUM*. Conidiophores simple or branched, bearing a single apical spore; mature conidia consisting of H-shaped bodies of 4 central cells and 8 lateral cells, the center cells horizontal and the lateral cells vertical, hyaline; saprophytic.

Fig. 130. *C. japonense*; redrawn from Tubaki (288).

131. *CLATHROSPHAERINA* Zaluski. Mycelium aquatic, branched, septate, hyaline; definite conidiophore not evident; conidia hyaline, multicellular, a spherical network produced by repeated forking and meeting of the tips; saprophytic, aquatic.

Fig. 131. *C. zalewskii*; redrawn from Tubaki (288). Other reference (30).

132. *SPIROSPHAERA* Beverwijk. Aero-aquatic fungus with branched, septate, mycelium, hyaline to fuscous; conidiophores little differentiated; conidium consisting of branched septate coils, hyaline to light fuscous, forming spherical to subspherical bodies; saprophytic on leaves in water.

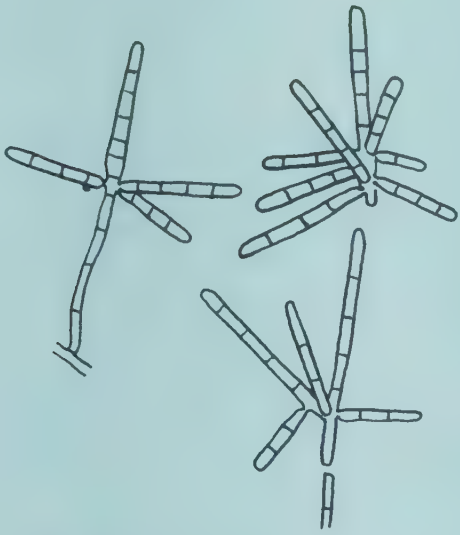
Fig. 132. *S. floriforme*; redrawn from van Beverwijk (30).

133. *CIRCINOCONIS* Boedijn. Conidiophores straight, dark, mostly provided with 2 equally long branches arising opposite each other near the apex; conidia solitary, apical on the side branches, relatively large, dark, consisting of one coil of cells ending in a blunt beak; saprophytic.

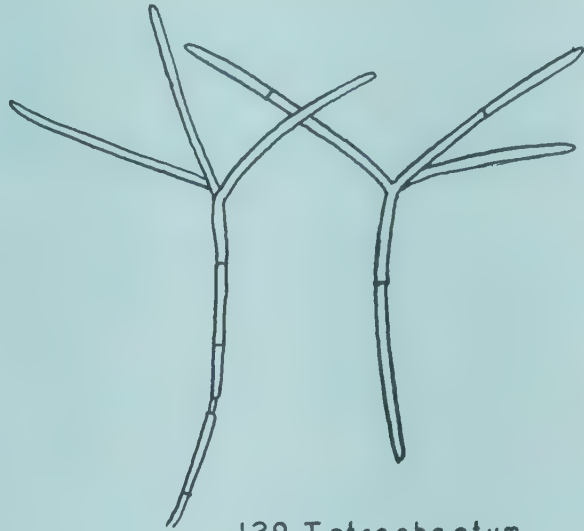
Fig. 133. *C. paradoxa*; redrawn from Boedijn (34).

134. *TRICELOPHORUS* Ingold. Submerged, aquatic, with branched, septate mycelium; conidiophores simple, slender; conidia terminal, branched, consisting of (1) an elongated main axis continuous with the conidiophore, and (2) elongated branches forming a whorl of 3 branches arising from the lower part of the main axis, hyaline; saprophytic on decaying leaves in water.

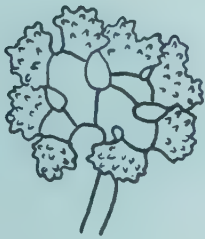
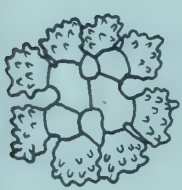
Fig. 134. *T. monosporus*; redrawn from Tubaki (287). Other reference (158).



128. *Dendrospora*



129. *Tetrachaetum*



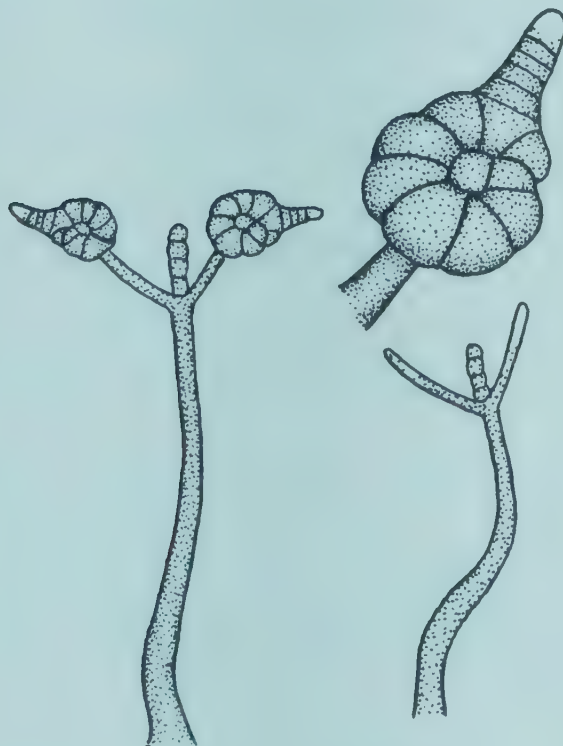
130. *Candelabrum*



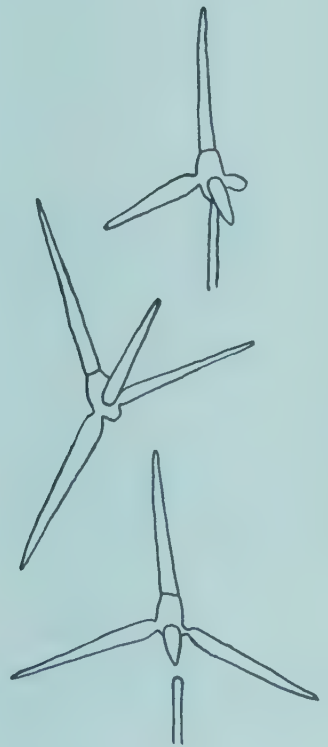
131. *Clathrosphaerina*



132. *Spirosphaera*



133. *Circinoconis*



134. *Tricelophorus*

135. DREPANOCONIS Schroet. and Henn. Sporodochia flat to cushion-shaped, bursting out from the tissue of the host; conidiophores rather short, hyaline; conidia hyaline, 1-celled, curved or bent; parasitic or saprophytic.

Fig. 135. *D. larvaeformis*; A, sporodochium; B, conidia; redrawn from Linder (179). Other reference (197).

136. HELICOMA Corda. Conidiophores dark, rather stout, septate, mostly simple; conidia hyaline or dark, septate, rather tightly curled; saprophytic on wood and bark.

Fig. 136. *H. mulleri*; original, from herbarium material on maple wood. Reference (179, 197).

137. HELICOMINA Olive. Conidiophores dark, slender, elongate, simple or branched, multiseptate; conidia colored, straight, curved or coiled, septate, produced terminally and laterally; parasitic on higher plants. The genus differs from *Helicoma* in being parasitic and by producing a large number of straight conidia in addition to curved or coiled ones.

Fig. 137. *H. caperoniae*; redrawn from Olive (205). Other reference (197).

138. EVERHARTIA Sacc. and Ellis. Sporodochia somewhat stalked, with an expanded top, dark at the base; conidiophores slender, hyaline, branched; conidia hyaline, septate, flat, curved or bent; saprophytic on wood.

Fig. 138. *E. lignatilis*; A, sporodochium; B, conidiophores and conidia; redrawn from Thaxter (277). Other references (179, 197).

139. HOBSONIA Berk. Sporodochia wart-like, light colored; conidiophores hyaline, slender; conidia hyaline, many-celled, coiled in a loose spiral; saprophytic on plant material.

Fig. 139. *H. mirabilis*; A, portion of sporodochium; B, conidia redrawn from Linder (179). Other reference (197).

140. HELICOSPORIUM Nees. Conidiophores tall, slender, colored, septate, simple or branched, bearing conidia laterally; conidia hyaline or colored, septate, coiled; saprophytic on decaying plant material.

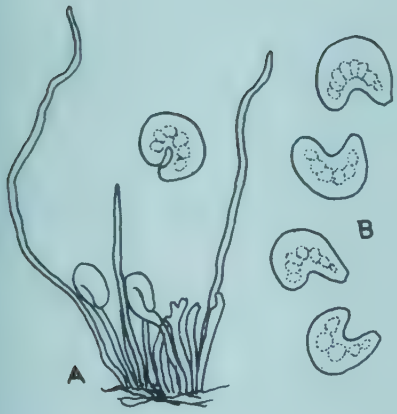
Fig. 140. *H. vegetum*; redrawn from Linder (179). Other reference (197).

141. HELICOMYCES Link. Conidiophores hyaline, short or elongate; conidia hyaline or subhyaline, septate, conidial filaments thin, hygroscopic, tightly coiled; saprophytic on decaying wood.

Fig. 141. A, *H. scandens*; B, *H. roseus*; redrawn from Linder (179). Other reference (197).

142. TROPOSPORELLA Karst. Sporodochia cushion-shaped, brown; conidiophores dark, branched, cells of branches short; conidia dark, several celled, in a flat coil (like the conidia of *Helicoma*); saprophytic on bark.

Fig. 142. *T. fumosa*; A, sporodochium; B, conidiophores, and conidia; redrawn from Linder (179). Other reference (197).



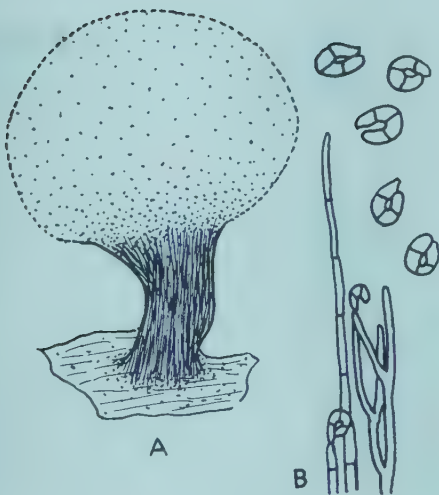
135. *Drepanoconis*



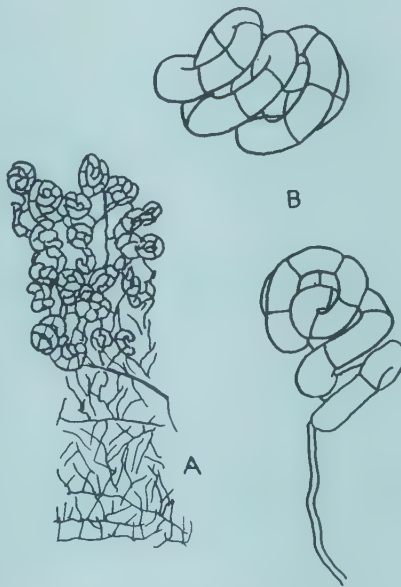
136. *Helicoma*



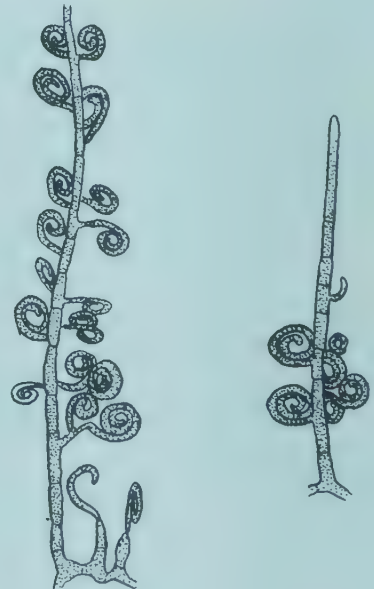
137. *Helicomina*



138. *Everhartia*



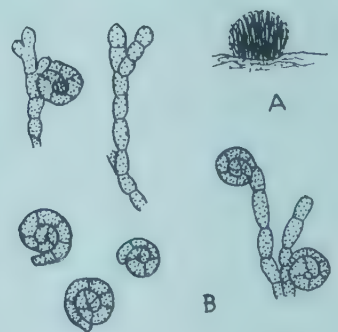
139. *Hobsonia*



140. *Helicosporium*



141. *Helicomycetes*



142. *Troposporella*

143. **HELICOON** Morgan. Conidiophores long, slender, simple or branched, hyaline or dark; bearing conidia terminally or laterally; conidia hyaline or dark, coiled to form an ovoid or ellipsoid spore, borne singly; saprophytic on decaying wood.

Fig. 143. A, *H. auratum*; redrawn from Linder, (179); B, *H. thaxteri*; redrawn from Linder (180). Other reference (197).

144. **XENOSPORELLA** Hohn. Conidiophores dark, comparatively short and stout, simple or branched, septate; conidia dark, tightly coiled, having both transverse and longitudinal septa; saprophytic on decaying plant material.

Fig. 144. *X. berkeleyi*; redrawn from Linder (179). Other reference (197).

145. **HELICODENDRON** Peyron. Conidiophores hyaline, branched, septate, bearing conidia terminally; conidia subhyaline to brown, coiled to form a large ovoid or ellipsoid spore, smaller, younger spores formed on the sides of the other spores; saprophytic on decaying plant material.

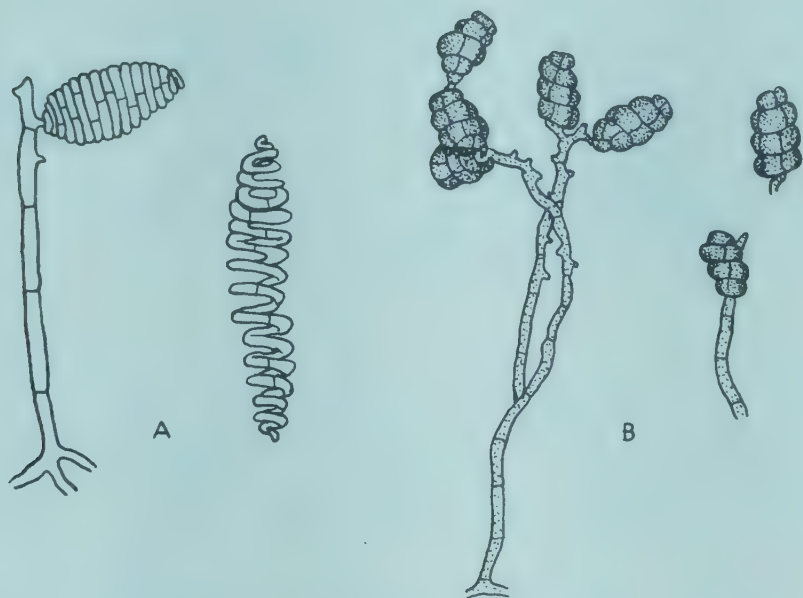
Fig. 145. *H. giganteum*; redrawn from Glen-Bott (107). Other references (108, 179, 197).

146. **TORULA** Pers. Conidiophores short or lacking, entire branches of mycelium developing into simple or branched erect chains of dark conidia, which separate readily saprophytic; similar to *Hormiscium* but conidia breaking apart more easily.

Fig. 146. *T. herbarum*; original, from culture.

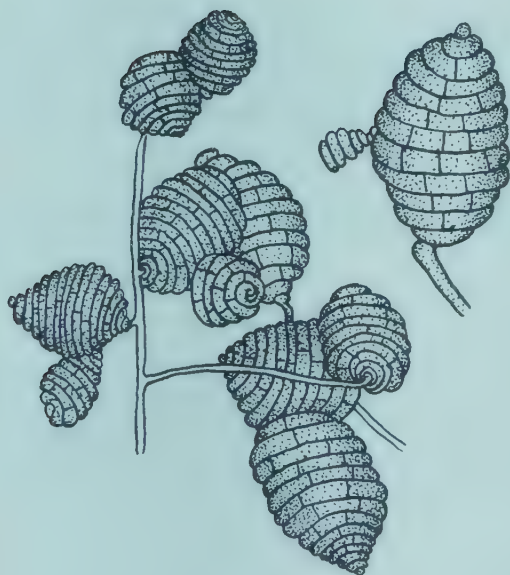
147. **HORMISCIUM** Kunze. Entire mycelium developing into chains of rounded or oblong, 1-celled conidia which separate with difficulty; saprophytic on decaying vegetable material. See Hughes (153) for relationship to *Torula* Pers.

Fig. 147. *Hormiscium* sp.; original, from fresh living material on wood.
A, habit on wood; B, branches of conidia.

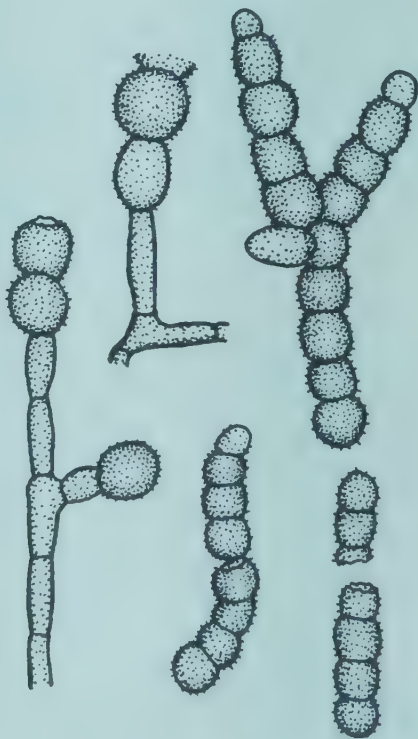


143. Helicoon

144. Xenosporella



145. Helicodendron



146. Torula



A



B

147. Hormiscium

148. *PULLULARIA* Berk. Mycelium not extensive, hyaline when young, becoming dark with age, black and shiny in old cultures, bearing abundant conidia laterally; conidia subhyaline or dark, 1-celled, ovoid, producing other conidia by budding; saprophytic or weakly parasitic; common in soil. Light variants resemble *Candida*.

Fig. 148. *P. pullulans*; original, from culture. A, young colony; B, hyphae and groups of conidia from near edge of colony; C, portions of hyphae showing production and budding of conidia.

149. *GLIOMASTIX* Gueg. Mycelium hyaline to dark, forming aerial "ropes", in culture; conidiophores lightly pigmented, slender, simple, somewhat tapered toward the apex; conidia dark, 1-celled, globose, ovoid or oblong; described as being produced endogenously, but this character is not easily seen, sometimes hanging together in small clusters in mucilage; saprophytic.

Fig. 149. *G. convoluta*; original, from culture. A, appearance of aerial mycelium in culture; B, a single strand of interwoven hyphae bearing conidiophores; C, conidiophores and conidia. Reference (38).

150. *ZYGOSPORIUM* Mont. Conidiophores erect, simple, brown at the base, apical cell hyaline or subhyaline; spore-bearing structure single, near base of conidiophore, consisting of stipe cell, a dark prophialide and subhyaline phialides; conidia 1-celled, hyaline, ovoid; saprophytic.

Fig. 150. *Z. oscheoides*. Redrawn from Subramanian (249). Other reference (131).

151. *PHIALOPHORA* Medlar. Mycelium hyaline to dark in culture; conidiophores dark, short, or absent; phialides variable in shape but usually broader near the middle and tapering toward both ends, the apex flaring, producing conidia endogenously; conidia subhyaline to dark, mostly ovoid, 1-celled, extruding from the flaring tip of the phialide; parasitic or saprophytic.

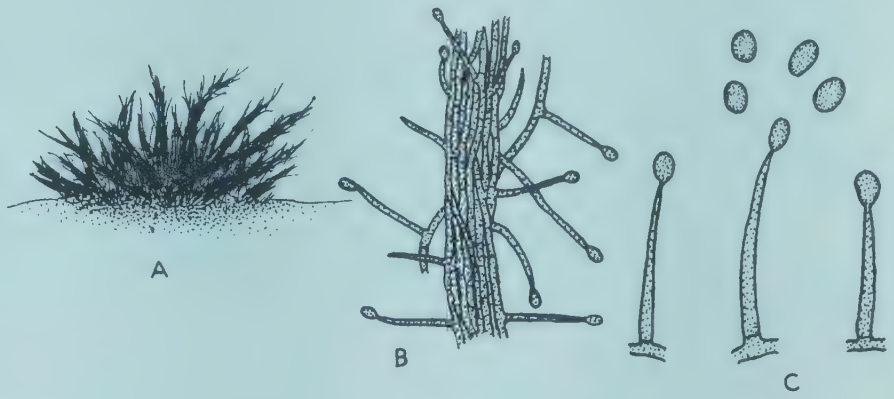
Fig. 151. *Phialophora* sp.; original, from culture. Reference (42).

152. *CATENULARIA* Grove. Conidiophores fuscous, erect, simple, septate, the terminal cell producing conidia endogenously; conidia hyaline or becoming fuscous with age, 1-celled, at first internal but later external and in short chains; saprophytic on wood.

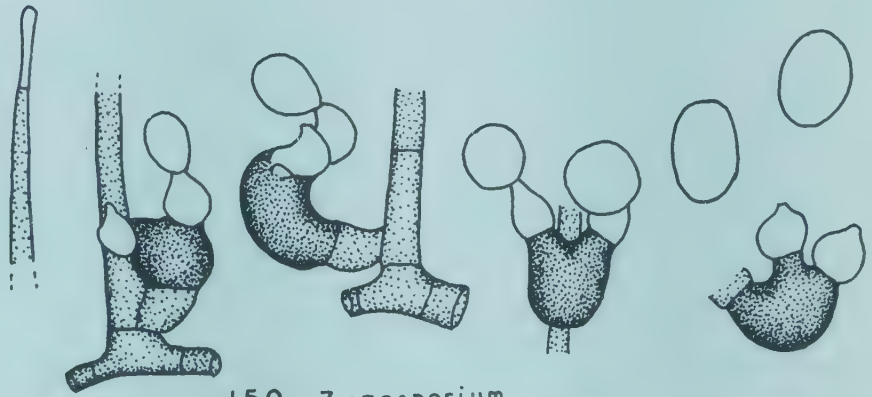
Fig. 152. *Catenularia* sp.; original, from fresh material on decayed wood. A, conidiophores and conidia held in a small amount of mucilaginous material when grown in saturated atmosphere; B, conidiophores enlarged showing production of endoconidia.



148. *Pullularia*



149. *Gliomastix*



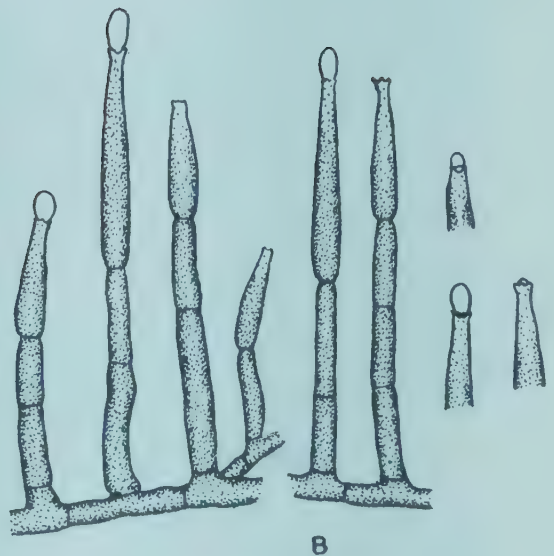
150. *Zygosporium*



151. *Phialophora*



A



B

152. *Catenularia*

153. *CHALARA* Corda. Mycelium typically dark; conidiophores typically with some dark pigment but hyaline under some cultural conditions, unicellular or basal portion septate, the apical cell tapering upward slightly and producing conidia endogenously; endoconidia hyaline, rod-shaped, somewhat variable in length, often hanging together in chains; parasitic or saprophytic.

Fig. 153. *C. quercina* (*Ceratocystis fagacearum*); original, from pure culture. A, conidiophores produced on old mycelium on agar; B, endoconidia; C, conidiophores produced submerged in liquid culture. Reference (118).

154. *HUGHESIELLA* Batista and Vital. Conidiophores hyaline, of 2 forms, short phialides producing ellipsoid, 1-celled, dark endoconidia in long chains; hyphal branches producing 1-celled, lenticular, dark spores with an equatorial hyaline band, single, catenulate, or in loose clusters; saprophytic.

Fig. 154. *H. euricoi*; redrawn from Batista and Vital (21). A, conidiophores producing endospores in chains; B, lenticular conidia on simple conidiophores.

155. *CHALAROPSIS* Peyron. Mycelium hyaline to dark in culture; conidiophores usually pigmented, slender upper cell slightly larger near the base and tapering upward; producing conidia endogenously; endoconidia hyaline, rod-shaped, often in chains or in masses; chlamydospores present, ovoid, dark, thick-walled, produced terminally, singly or in short chains; parasitic or saprophytic; similar to *Chalara* except for the production of chlamydospores.

Fig. 155. *Chalaropsis* sp. Original from pure culture. A, hyphae with chlamydospores and one typical conidiophore; B, conidiophores and chains of endoconidia.

156. *BISPOROMYCES* van Beyma. Conidiophores erect, simple, septate, dark, frequently proliferating at the apex after producing an apical head of conidia, with a distinct collarette at apex; conidia 1-celled, hyaline, endogenous, frequently in pairs at the end of the conidiophore or held together in small heads by mucus; chlamydospores (where present) 1-celled, terminal; saprophytic, on decaying wood.

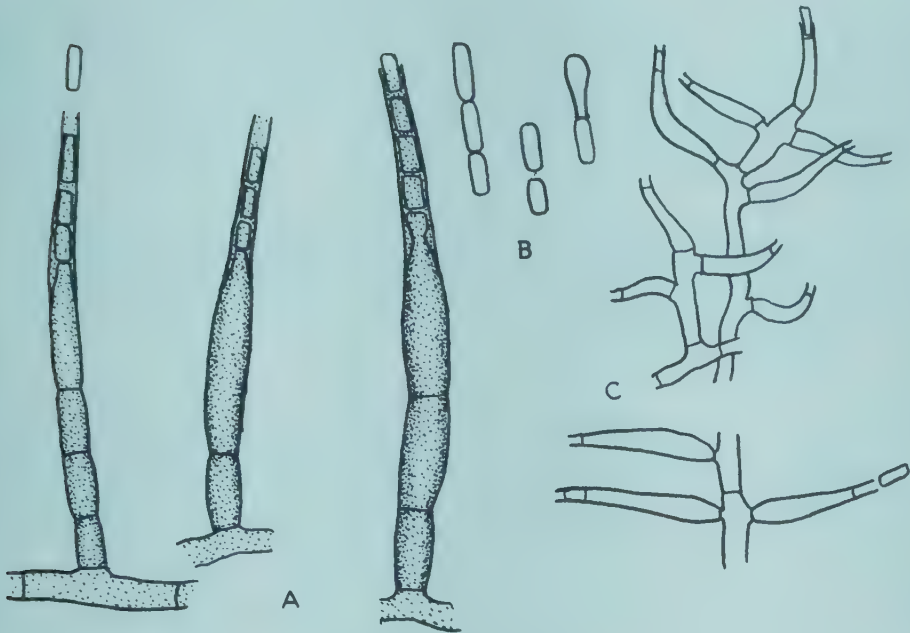
Fig. 156. *Bisporomyces* sp.; original, from culture. References (191, 192).

157. *HORMISCIOMYCES* Bat. and Nasc. Mycelium brown, hyphae elongate, branching at right angles, septate, constricted, spinescent; conidiophores erect, simple, smooth septate; conidia apical, clustered, 1-celled, dark, globose; on leaves.

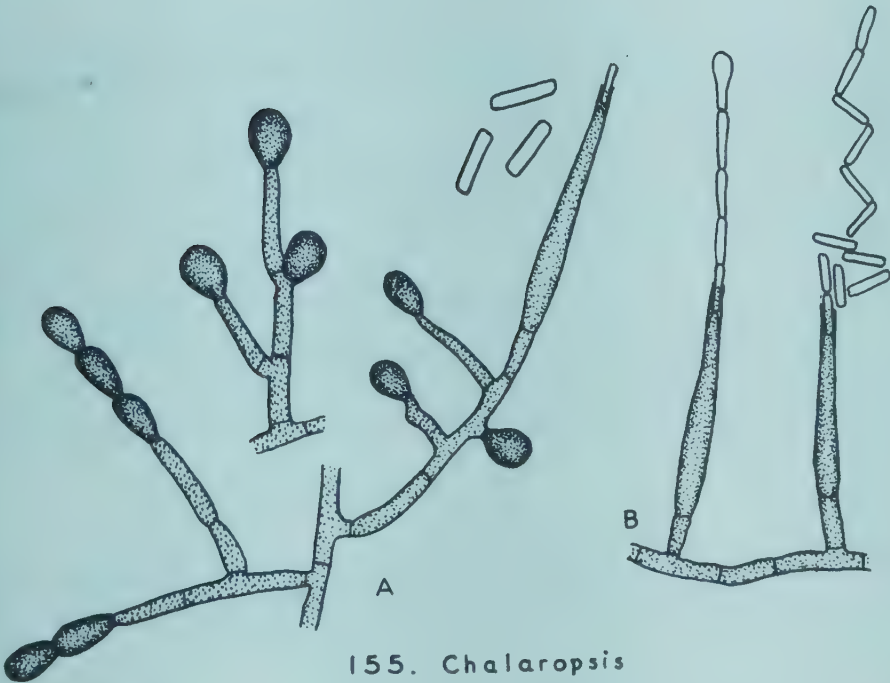
Fig. 157. *H. prepusum*; redrawn from Batista and Nascimento (20).

158. *MARGARINOMYCES* Laxa. Mycelium dark, closely septate; conidiophores indefinite or none; phialides developing laterally from main hyphae or apically on short branches; flask-shaped, with a distinct collarette, pale-colored; conidia 1-celled, hyaline to subhyaline, endogenous, sticking together in small masses; saprophytic.

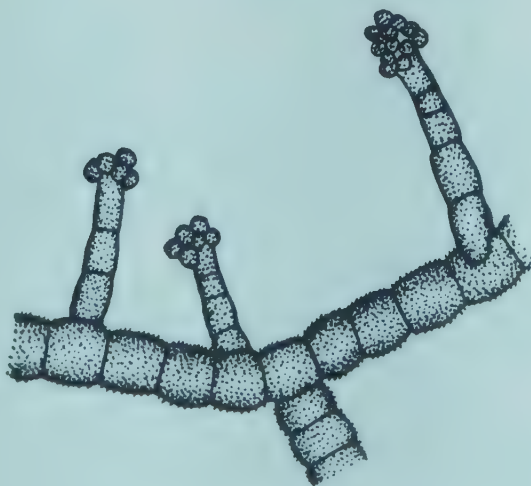
Fig. 158. *M. bubaki*; original, from culture.



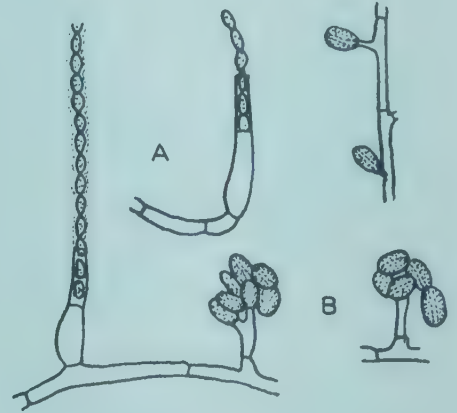
153. *Chalara*



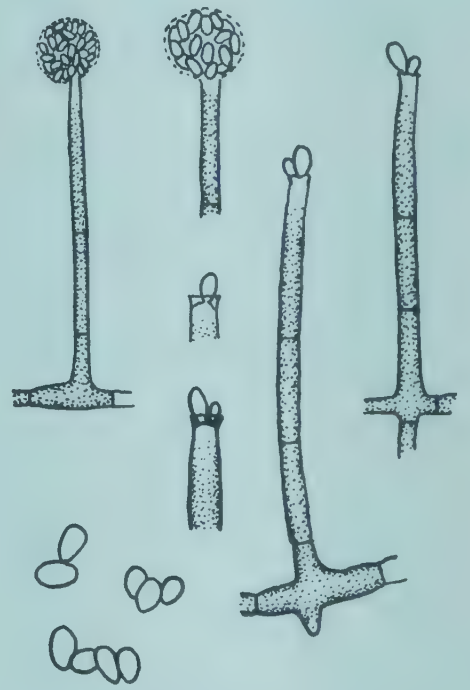
155. *Chalaropsis*



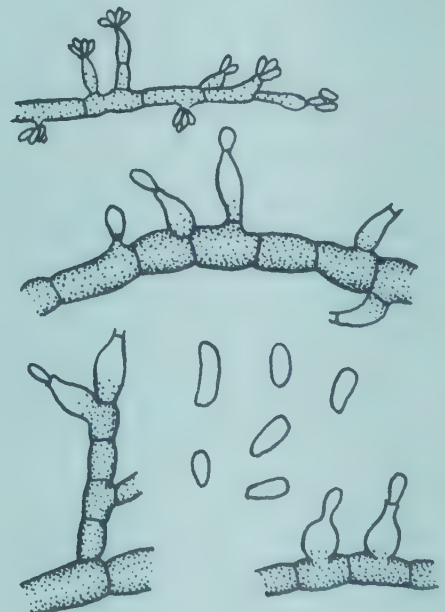
157. *Hormisciomyces*



154. *Hughesiella*



156. *Bisporomyces*



158. *Margarinomyces*

159. **THIELAVIOPSIS** Wetn. Mycelium white to gray in culture; conidiophores on short lateral branches of mycelium, subhyaline to dark, the terminal cell slightly broader at the base and tapering upward, producing spores endogenously; endoconidia hyaline rod-shaped, formed in chains or masses; on other branches the apical cells become dark, thick-walled chlamydospores which eventually break apart; parasitic or saprophytic; mostly conidial stages of species of *Ceratocystis*.

Fig. 159. *T. basicola*, original, from culture. A, conidiophores producing endoconidia; B, branches bearing chains of chlamydospores; C, a hypha producing both kinds of spores.

160. **IDRIELLA** Nelson and Wilhelm. Mycelium hyaline to brown; conidiophores brown, simple, non-septate, narrowed above, with prominent spore scars; conidia lunate to falcate, with pointed ends, produced in clusters near the apex of the conidiophore; chlamydospores brown, several-celled; believed to be parasitic on strawberry roots.

Fig. 160. *I. lunata*; drawn from photographs by Nelson and Wilhelm (204).

161. **CRYPTOSTROMA** Gregory and Waller. Mycelium massing to form extensive stroma within the bark; stroma consisting of a floor composed of a layer of conidiophores, a roof which is held by by fungus columns, and a mass of conidia between the floor and roof; the outer bark and roof are finally sloughed off exposing the conidial mass; conidiophores short, septate, the terminal cell producing conidia endogenously; conidia mostly ovoid, dark, 1-celled, collecting in a dry mass.

Fig. 161. *C. corticale*; A, section of stroma within the bark, showing the floor (f), the roof (r), the outer bark (b), the supporting columns (c), and the spore mass (s); B, portion of floor showing conidiophores and conidia; C, conidiophores and endoconidia. Redrawn from Gregory and Waller (112).

162. **PHAEOSCOPIULARIOPSIS** Ota. Conidiophores simple, short, slender; conidia 1-celled, dark, borne apically in chains; considered as an earlier name for *Masoniella* Smith.

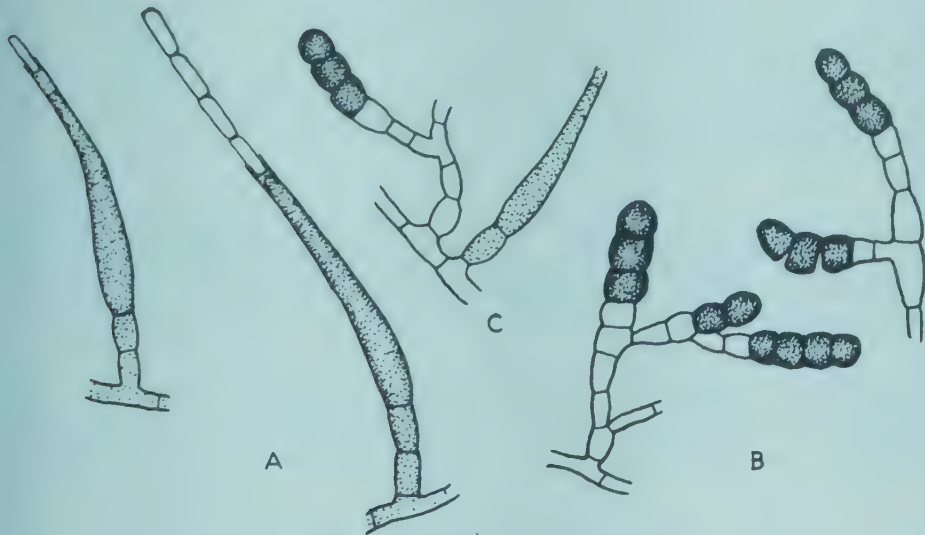
Fig. 162. *P. aterrima*; redrawn from Subramanian (259).

163. **PSEUDOCAMPTOUM** Frag. and Cit. Conidiophores in tufts arising from a stroma immersed in the substratum, erect, straight or bent, septate, simple, brown; conidia 1-celled, flattened, with a pale ridge on the convex side, borne apically on new growing points, remaining attached laterally near the apex; saprophytic.

Fig. 163. *P. fasciculatum*; redrawn from Subramanian (255). A, conidiophores arising from stromatic tissue; B, tips of conidiophores; C, conidia.

164. **MONILOCHAETES** Halst. Conidiophores dark, erect, slender, usually simple, septate; conidia hyaline or becoming pigmented in age, borne singly at the apex or produced in chains under conditions of high humidity; parasitic.

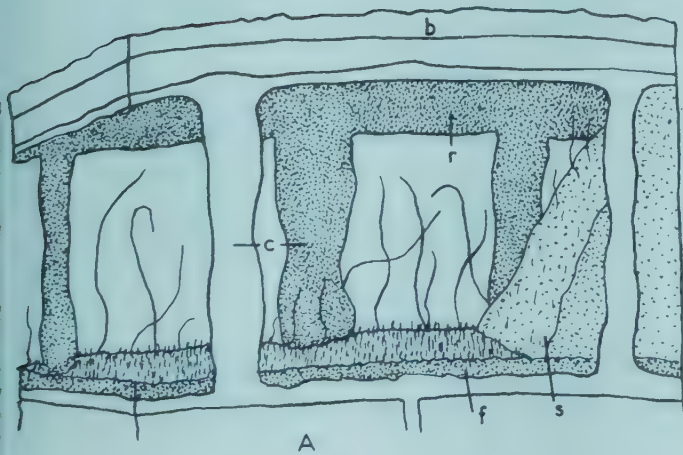
Fig. 164. *M. infuscans*; A, C, conidiophores and conidia on sweet potato; B, D, conidiophores and conidia produced in culture. A, B, redrawn from Harter (115). C, D, redrawn from Taubenhaus (272).



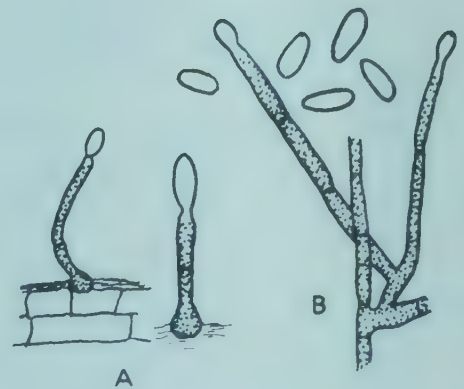
159. *Thielaviopsis*



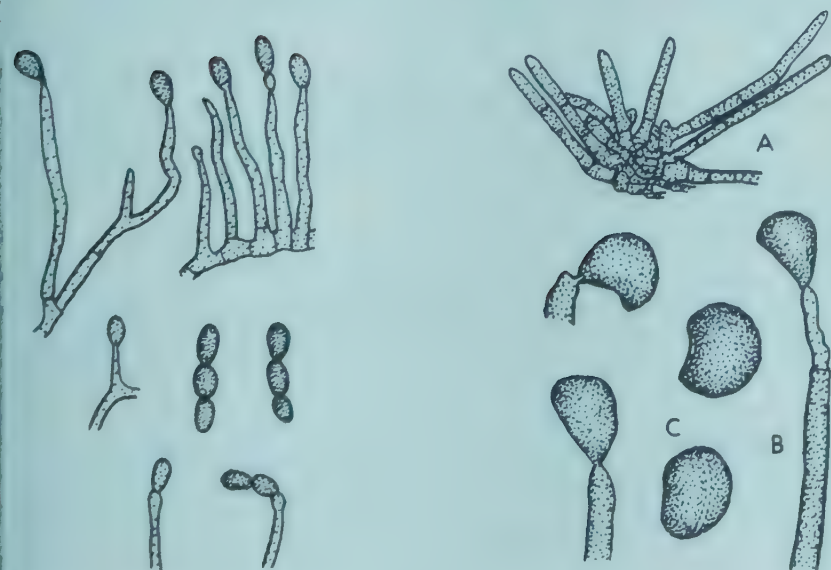
160. *Idriella*



161. *Cryptostroma*



164. *Monilochaetes*



162. *Phaeoscopulariopsis*

163. *Pseudocamptoum*

165. *PAPULARIA* Fr. Conidiophores short, simple, hyaline, composed of short lateral branches from hyphal cells; conidia 1-celled, dark, ovoid, often lenticular in side view, with a light band seen in edge view; saprophytic.

Fig. 165. *Papularia* sp.; original, from culture. Reference (94).

166. *ELLISIELLA* Sacc. Sterile hyphae (setae) erect, simple, dark; conidiophores short at base of the setae, subhyaline; conidia borne singly at apex, fusoid, curved, with a single apical beak or appendage, 1-celled, hyaline or subhyaline; saprophytic.

Fig. 166. *E. caudata*; original, from herbarium material on stem of *Andropogon furcata*. A, habit on stem; B, spines, conidiophores and conidia; C, conidia.

167. *NIGROSPORA* Zimm. Conidiophores short, cells somewhat inflated, dark, mostly simple; conidia black, 1-celled, globose to somewhat flattened, situated on a flattened, hyaline vesicle at the end of the conidiophore; parasitic on plants or saprophytic.

Fig. 167. *N. sphaerica*; original. A, conidiophores and conidia from herbarium material on dead corn stalk; B, conidiophores and conidia; C, tip of conidiophore showing hyaline vesicle; B, C, from culture. Reference (241).

168. *ARTHRIINIUM* Kunze. Conidiophores dark, upright, simple, septate with thick basal septa; conidia dark, 1-celled, fusoid, oblong, curved to cuspidate, attached laterally; saprophytic on plant material.

Fig. 168. *A. cuspidatum*; original, from herbarium material on leaves of *Juncus*. A, habit showing cluster of conidiophores; B, conidiophore and conidia; C, conidia. References (55, 94).

169. *MONOTOSPORA* Sacc. Mycelium dark; conidiophores dark, erect, slender, septate, simple, bearing a conidium terminally, other conidia sometimes attached laterally; conidia large, 1-celled, ovoid to ellipsoid, saprophytic. See Hughes (153) for synonymy with other genera.

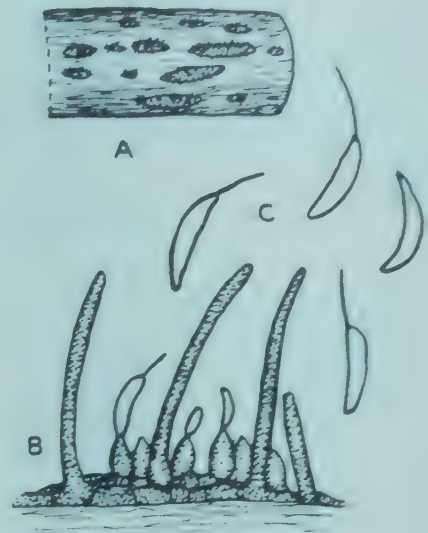
Fig. 169. *M. altissima*; original, A, B, conidiophores and conidia on dead root of *Tsuga canadensis*; C, D, conidiophores and conidia produced in culture obtained from material shown in A.

170. *PERICONIA* Bon. Conidiophores dark, long, stout, simple, short-branched near the apex which bears a loose head of conidia; conidia dark, 1-celled, globose; parasitic or saprophytic.

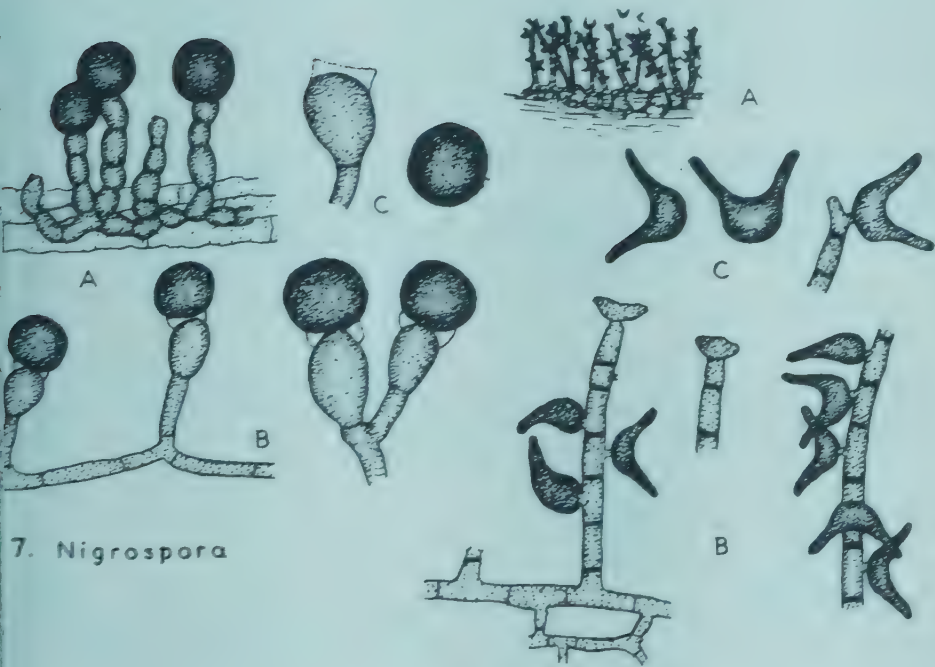
Fig. 170. *P. byssoides*; original from herbarium material on dead stem of *Polymnia*. A, group of conidiophores; B, conidiophore enlarged; C, tips of conidiophores bearing conidia; D, conidia. References (193, 256).



165. *Papularia*



166. *Ellisiella*



168. *Arthriniium*



169. *Monotospora*



170. *Periconia*

171. HUMICOLA Traaen. Conidiophores erect, straight, sometimes septate, simple or rarely with short branches, brown; conidia single apical, globose or subglobose, brown, 1-celled; some species also producing simple phialides directly from aerial mycelium; phialides 1-celled, tapering upward, producing small, ovoid conidia in chains; saprophytic, from soil.

Fig. 171. *H. fuscoatra*; original, from culture. A, conidiophores and conidia; B, phialides and chains of small conidia. Reference (291).

172. ZYGODESMUS Corda. Conidiophores short, mostly simple, hyaline; conidia 1-celled, dark, globose or ovoid, mostly spiny.

Fig. 172. *Zygodesmus* sp.; original, from culture.

173. GONATOBOTRYUM Sacc. Conidiophores dark, long, stout, simple or sparingly branched, septate, nodes or inflated cells intercalary or terminal, denticulate and bearing the conidia; conidia dark, 1-celled, ovoid to short cylindrical. *G. fuscum* bears conidia in chains of two; saprophytic, or parasitic on other fungi.

Fig. 173. *G. maculicolum*; original, from herbarium material on leaves of *Hamamelis virginiana*. A, group of conidiophores; B, conidiophore enlarged; C, tip of conidiophore bearing conidia; D, conidia. Reference (149).

174. ECHINOBOTRYUM Corda. Conidiophores consisting of short, branched, undifferentiated hyphae, or nearly absent; conidia ovoid or somewhat flask-shaped, smooth or rough, formed in clusters at hyphal tips, dark, 1-celled.

Fig. 174. *E. atrum*; original, from culture.

175. ACREMONIELLA Sacc. Conidiophores upright, simple, each bearing a single apical conidium; conidia globose to ovoid, 1-celled, brown; saprophytic or parasitic, on plants.

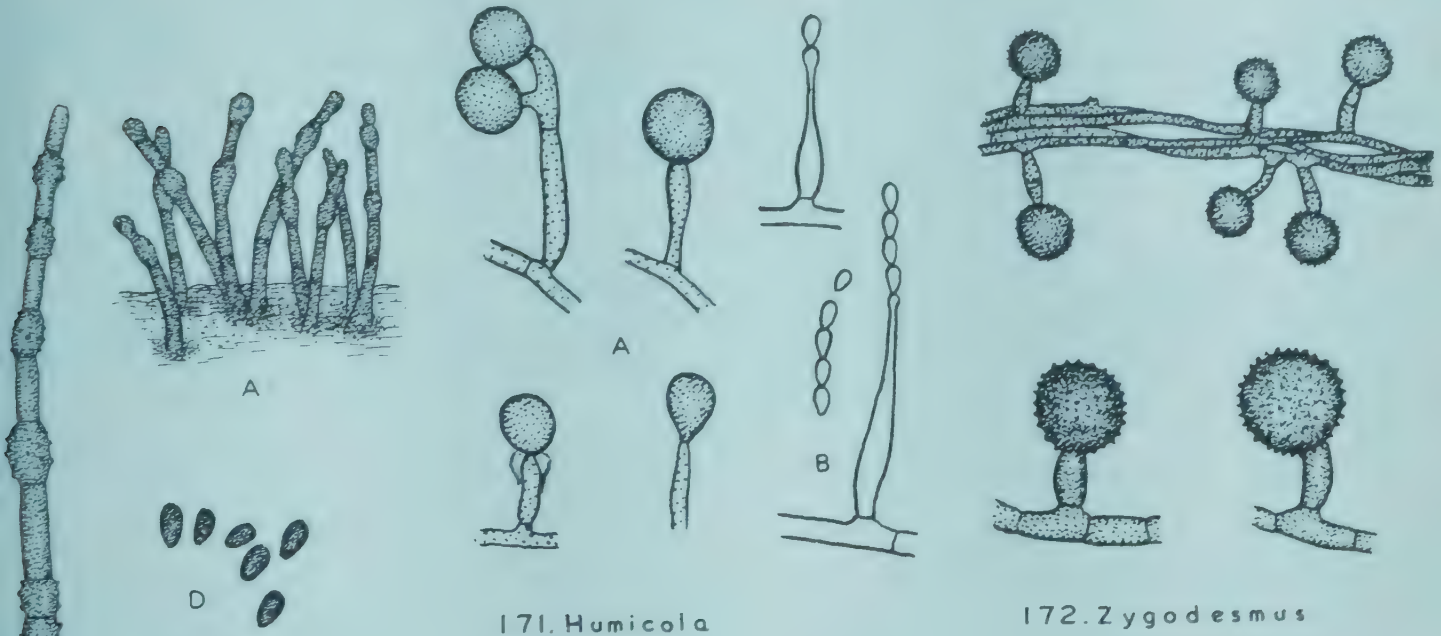
Fig. 175. *Acremoniella* sp.; redrawn from Sprague (246). Other reference (114).

176. VIRGARIA Nees. Conidiophores erect, simple or forked, or scantily upright-branched, septate, dark; conidia apical and lateral near the apex of the branches, globose or ovoid, usually asymmetrical, 1-celled, dark; saprophytic.

Fig. 176. A, *V. nigra*; from herbarium material on bark of *Betula*; B, *Virgaria* sp.; from culture; both original. Reference (259).

177. ACROSTAPHYLUS Arnaud. Conidiophores erect, brown, branched, septate; sporogenous cells simple, lateral or terminal on conidiophore or its branches, short thick-walled; conidia produced singly on short teeth or sporogenous cells, forming a loose, dry head or cluster, subhyaline to brown, 1-celled; saprophytic, on wood.

Fig. 177. A, *A. lignicola*; redrawn from Subramanian (259); B, C, *Acrostaphylus* sp. (Conidial stage of *Hypoxylon atropunctatum*); the conidial stage appears to belong to this genus and is illustrated here because of the prevalence of this fungus on hardwoods in the United States; original from culture.



171. *Humicola*

172. *Zygodermus*



173. *Gonatobotryum*

174. *Echinobotryum*

175. *Acremoniella*



176. *Virgaria*

177. *Acrostaphylus*

178. *CHLORIDIUM* Link. Conidiophores slender, lightly pigmented, mostly simple, 1-celled or septate; conidia subhyaline, 1-celled, globose or oblong, borne singly at apex and on sides of the upper portion of the conidiophore; saprophytic.

Fig. 178. *C. glaucum*; original, from culture isolated from oak wood.
Reference (288).

179. *SYMPODIELLA* Kendrick. Conidiophores solitary, erect to ascending, simple, septate, dark but lighter near apex; conidia 1-celled, hyaline, in unbranched chains, attached apically and laterally, cylindrical, with blunt ends; saprophytic, on pine needles.

Fig. 179. *S. acicola*; redrawn from Kendrick (174).

180. *BASIDIOTRYS* Hohn. Conidiophores dark to sub-hyaline, elongate-clavate, simple, with an enlarged globose or clavate apex; conidia hyaline, fusoid, 1-celled, produced on short thick cells which cover the apex of conidiophore; causing sapwood rot of hardwood trees.

Fig. 180. *Basidiobotrys* sp. (Conidial stage of *Hypoxyton punctulatum*).
Original, from culture isolated from oak wood; A-C, conidiophores and heads of conidia; D, conidia. Reference (12).

181. *STACHYBOTRYS* Corda. Conidiophores dark, simple, except at apex where a cluster of thick, short phialides are formed; conidia dark, 1-celled, globose to ovoid, borne at the apex of the phialides, not catenulate; saprophytic.

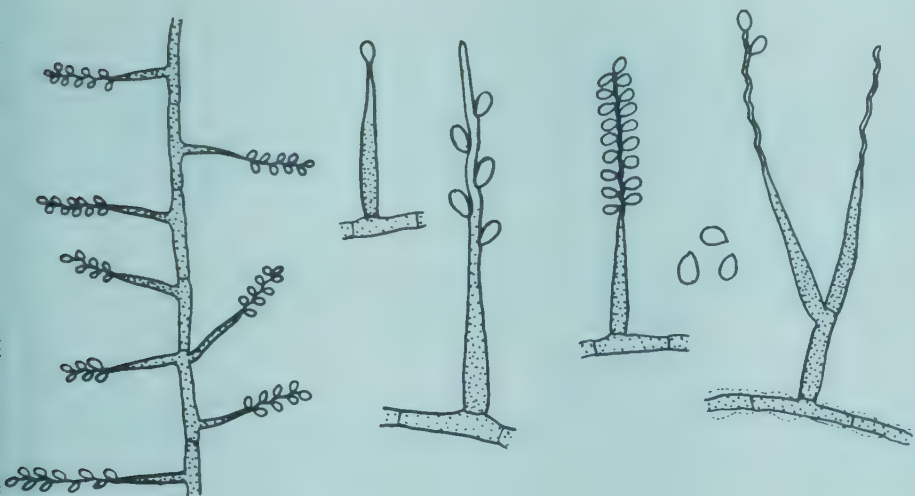
Fig. 181. *S. atra*; original, from culture isolated from soil. A, habit sketch; B, C, conidiophores and clusters of conidia; D, conidia. References (31, 268).

182. *MEMNONIELLA* Hohn. Conidiophores dark, simple except at the apex where a cluster of thick, short phialides are produced; conidia dark, 1-celled, globose, catenulate; saprophytic; probably closely related to *Stachybotrys*.

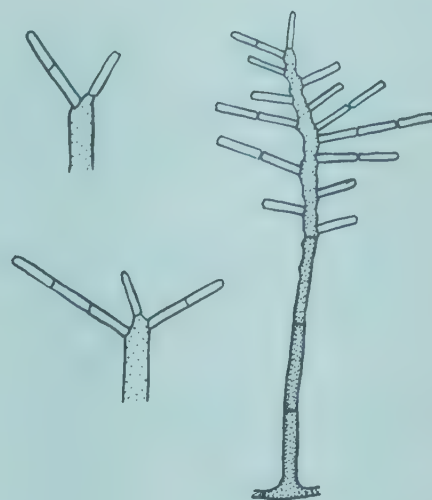
Fig. 182. *Memnoniella* sp.; drawn from photograph by Zuck (256).

183. *MENISPORA* Pers. Conidiophores dark, paler near the apex, septate, sparingly branched, bearing clusters of conidia terminally; conidia hyaline, 1-celled, fusi-form to falcate; saprophytic.

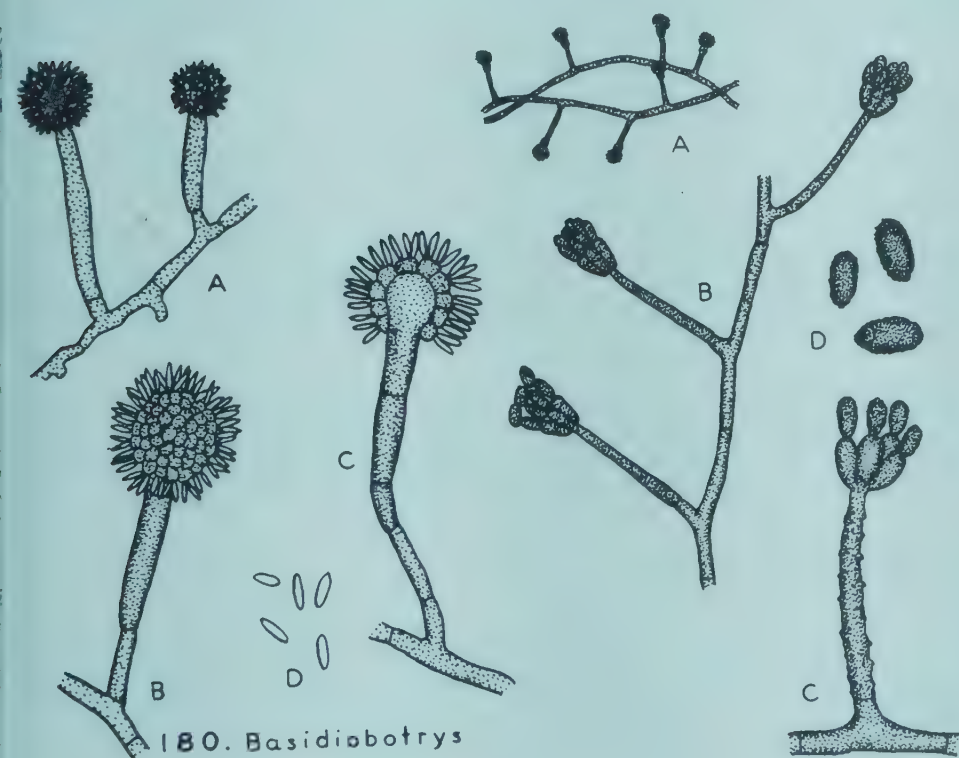
Fig. 183. A-C, *M. cobaltina*; original from herbarium material on dead leaves of *Nyssa*; D, *M. ciliata*; original from culture. Reference (275).



178. *Chloridium*



179. *Sympodiella*

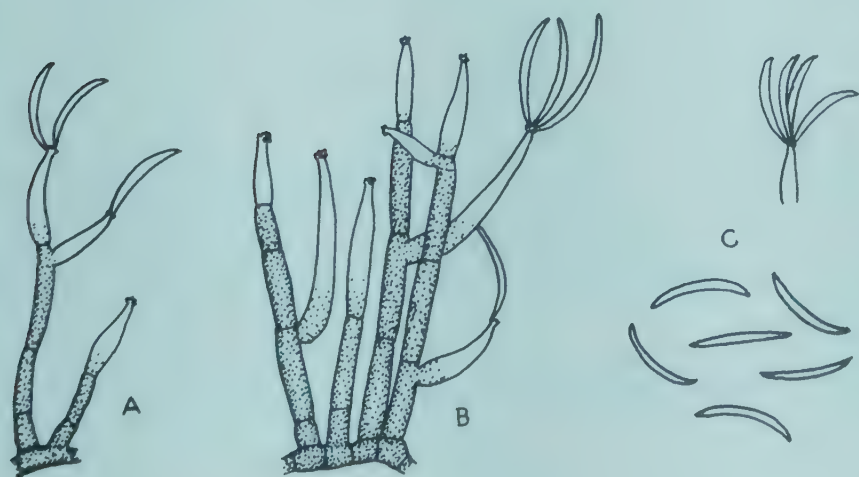


180. *Basidiobotrys*

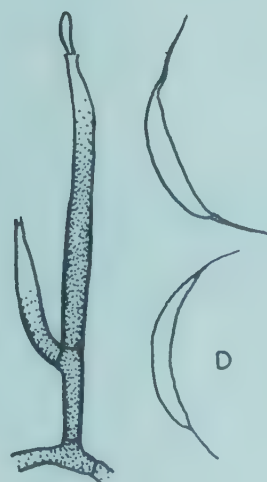
181. *Stachybotrys*



182. *Memnoniella*



183. *Menispora*



184. **WARDOMYCES** Brooks and Hansford. Conidiophores formed as lateral branches of the mycelium, hyaline, short, branched repeatedly, septate; conidia 1-celled, brown to black, ovoid to spherical, produced singly at apices of branches; saprophytic; isolated from meat in cold storage.

Fig. 184. *W. anomala*; original, from culture. Reference (36).

185. **SADASIVANIA** Subram. Colonies composed of scattered conidiophores with heads of conidia; conidiophore consisting of a main unbranched stipe, fertile near the apex; sporogenous cells simple, arising from upper part of stipe, thickened, dark at the lower part, forming simple or branched chains of conidia acropetally; conidia 1-celled, brown, globose, produced on the basal portion of the sporogenous cells; saprophytic.

Fig. 185. *S. girisa*; redrawn from Subramanian (262).

186. **ACROTHECA** Fuckel. Conidiophores dark, simple, septate, sporogenous portion at or near the apex; conidia dark to subhyaline, 1-celled, ovoid to short cylindrical, borne in loose clusters; mainly saprophytic.

Fig. 186. *A. dearnesseana*; original, from herbarium material of type collection on leaves of *Pyrus melanocarpa*; A, habit on leaf; B, conidiophores and conidia; C, conidia. Reference (128).

187. **ACROPHIALOPHORA** Edward. Conidiophores upright, tall, slender, mostly simple, dark, lighter toward the apex, bearing flask-shaped phialides irregularly near the apex (phialides often produced directly on the mycelium), hyaline or subhyaline; conidia 1-celled, hyaline or subhyaline, ovoid to broadly fusoid, cutenulate.

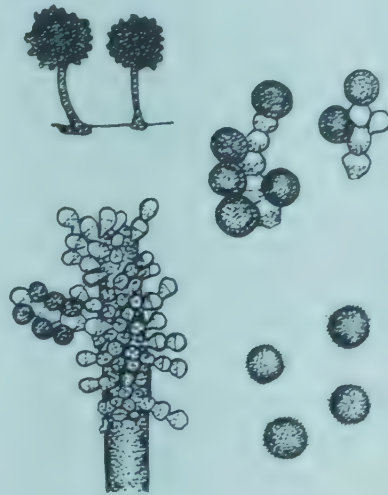
Fig. 187. *A. nainiana*; original, from culture; A, B, conidiophores with phialides; C, phialides borne directly on mycelium; D, conidia. Reference (89).

188. **STREPTOTHRIX** Corda. Mycelium dark, growing loosely on decaying vegetation; conidiophores erect, tall, monopodially branched, branches spirally coiled (appearing wavy); conidia single, apical or lateral, sessile or on short peg-like structures, 1-celled, dark; saprophytic. See Hughes (153) for synonymy with *Conoplea* Pers.

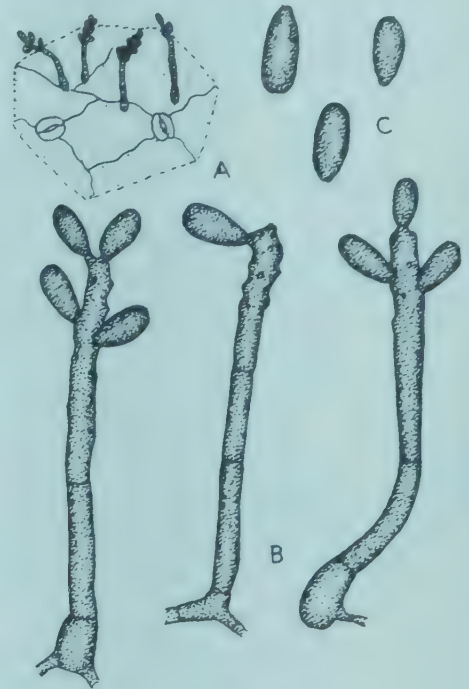
Fig. 188. *S. atra*; original, from herbarium material on wood.



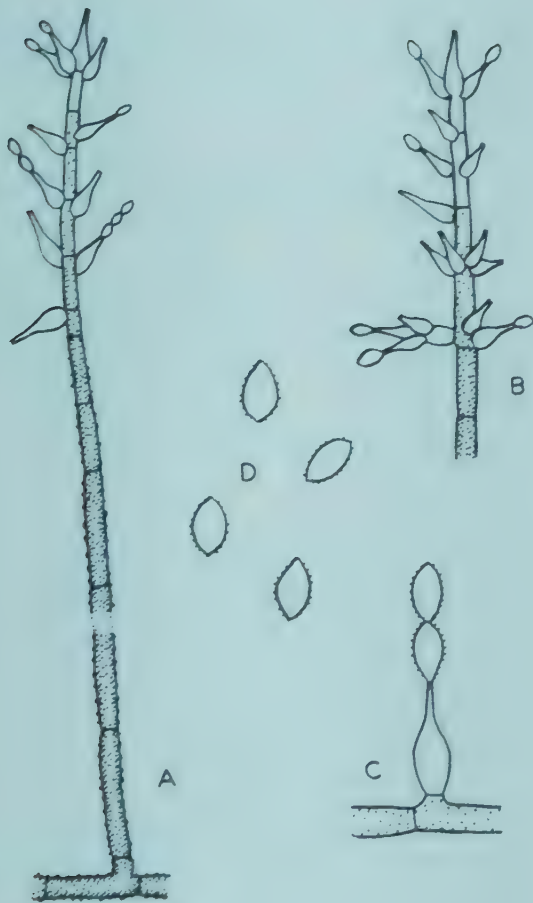
184. *Wardomyces*



185. *Sadasivania*



186. *Acrotheca*



187. *Acrophialophora*



188. *Streptothrix*

189. *BELTRANIA* Penzig. Setae brown, simple, septate, pointed; conidiophores simple or less often forked, brown, lighter at apex; conidia biconic, 1-celled, brown with a paler middle band, borne singly sometimes on ovoid separating cells; saprophytic.

Fig. 189. *B. indica*; A, C, conidiophores and conidia; B, seta. Redrawn from Subramanian (249). Other reference (134).

190. *BELTRANIELLA* Subramanian. Conidiophores erect, with dark-colored, seta-like main axis bearing lateral branches; conidia 1-celled, top-shaped, subhyaline to colored; saprophytic on dead leaves.

Fig. 190. *B. odinae*; A, conidiophore with seta-like main axis; B, C, fertile branch of conidiophore; D, conidia. Redrawn from Subramanian (250).

191. *HORMODENDRUM* Bon. Mycelium dark, colonies dark gray-green; conidiophores dark, slender, dextritically branched, the branches repeatedly forked, producing terminal conidia; conidia dark, 1-celled, ovoid to cylindrical with pointed ends, some conidia typically lemon-shaped; cells of branches may act as conidia; saprophytic, common in soil; frequently appearing as contaminants in cultures. This genus probably should be incorporated with *Cladosporium* (69). It is included here because of its prevalence in the literature.

Fig. 191. A, B, *Hormodendrum* sp.; original, from culture; A, conidiophores and conidia; B, conidia. References (69, 101, 173).

192. *LACELLINA* Sacc. Setae erect, tall, brown, simple; conidiophores intermixed with setae, shorter, paler, simple; conidia 1-celled, globose or ovoid, colored produced at or near the apex in acropetalous chains; saprophytic.

Fig. 192. *L. graminicola*; A, habit of setae and conidiophores; B, tip of seta; C, D, conidiophores and conidia. Redrawn from Subramanian (250).

193. *LACELLINOPSIS* Subramanian. Setae simple, septate, brown; conidiophores intermixed with setae, with globose fertile apex, becoming cupulate after detachment of conidia; conidia 1-celled, brown, globose, produced acropetally in chains.

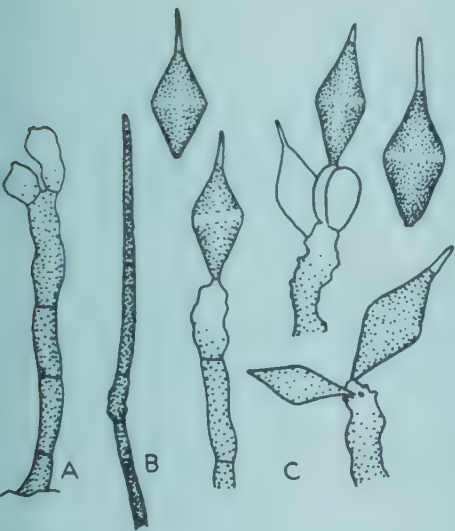
Fig. 193. *L. sacchari*; A, tip of seta; B, conidiophores and conidia; C, mature conidia. Redrawn from Subramanian (251).

194. *VERTICICLADIUM* Preuss. Conidiophores erect, septate, brown, branched verticillately above, ultimate branches pointed and producing conidia on new growing points older spores remaining attached on the sides of the branches; conidia 1-celled, hyaline or subhyaline.

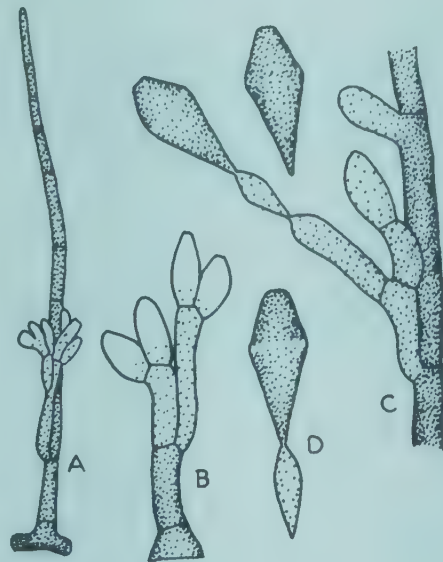
Fig. 194. *V. trifidum*; redrawn from Hughes (130).

195. *LEPTOGRAPHIUM* Lagerb. and Melin. Conidiophores upright, branched, the upper portion with penicillate branches; lower portion dark but variable in shade, upper branches hyaline; phialides slender; conidia hyaline, ovoid, held together in rather large heads by mucilaginous substance; parasitic on trees or saprophytic. *Scopularia* may be synonymous. Probably conidial stage of *Ceratocystis*.

Fig. 195. *Leptographium* sp.; original, from culture. A, habit showing group of conidiophores; B, upper portion of conidiophore; C, conidia. References (67, 109, 232).



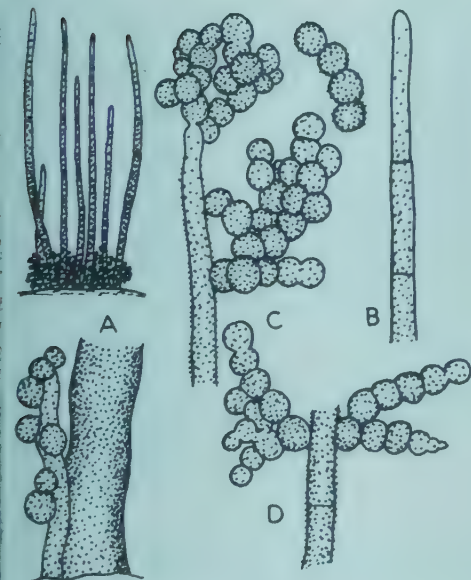
189. *Beltrania*



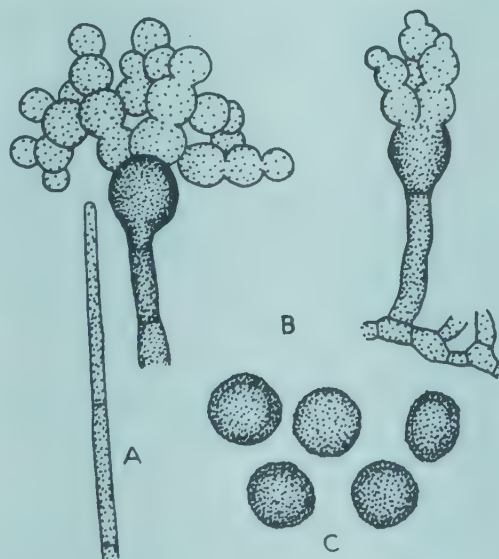
190. *Beltraniella*



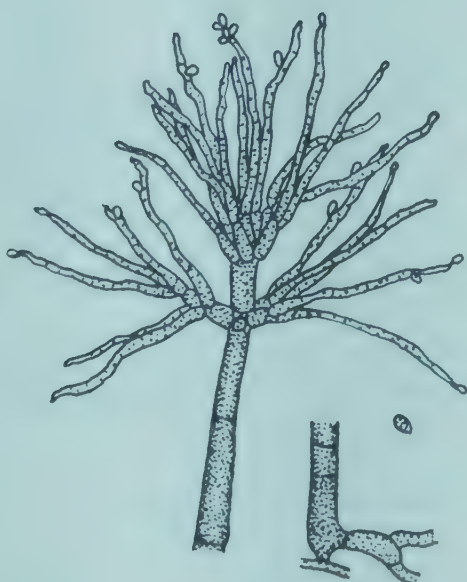
191. *Hormodendrum*



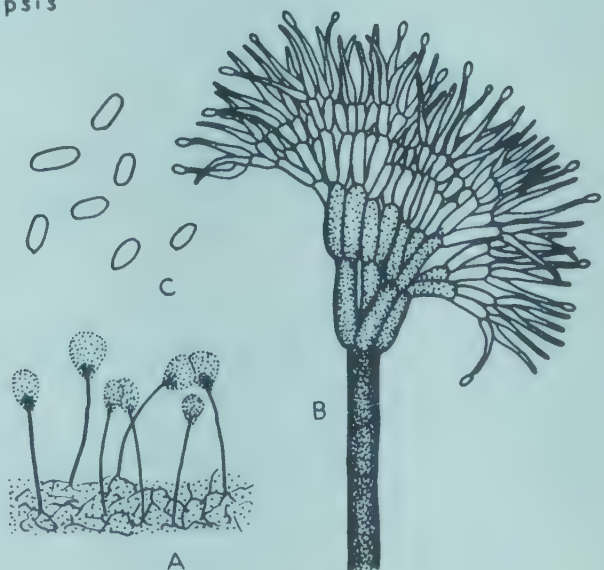
192. *Lacellina*



193. *Lacellinopsis*



194. *Verticicladium*



195. *Leptographium*

196. GONYTRICHUM Nees. Conidiophores dark, mostly tall, slender, sometimes terminating in a long slender sterile tip; phialides borne in groups on short lateral branches tapering and often curved; conidia hyaline or subhyaline, ovoid, collecting in small heads; saprophytic.

Fig. 196. *G. macrocladium* (*Mesobotrys macrocladia*); original, from culture isolated from soil. A, conidiophores and conidia on a dry mount; B, short simple conidiophores; C, branch of conidiophore and phialides. Reference (136).

197. PERICONIELLA Sacc. Mycelium effuse, velvety, dark, on living plants; conidiophores erect, dark, upper portion branched, branches producing sporogenous cells which bear spores apically; conidia 1-celled, dark, ovoid or oblong, borne in loose clusters.

Fig. 197. *P. velutina*; original, from herbarium material on *Brabijum stellatifolium*.

198. STACHYLIDIUM Link. Conidiophores dark, upright, slender, septate, branched; whorls of phialides borne directly on the main axis or on its branches; conidia subhyaline to brown, 1-celled, ovoid, small, held in heads by mucilaginous material; saprophytic on vegetable material.

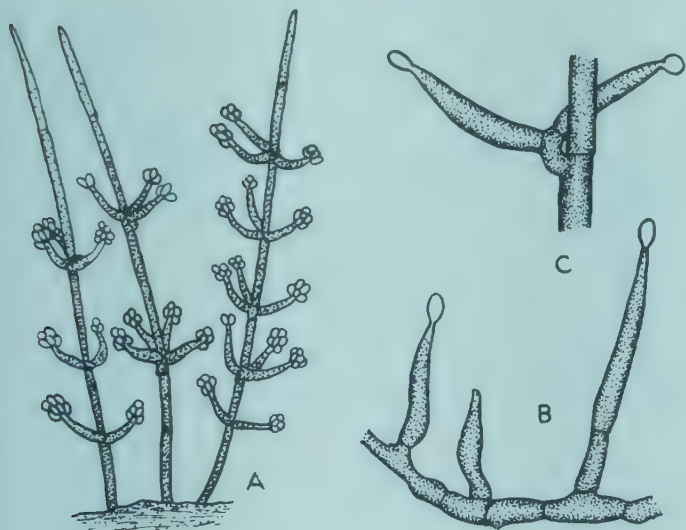
Fig. 198. *Stachylidium* sp.; original, from culture. Reference (93, 136).

199. CHAETOPSIS Grev. Conidiophores dark, long, main axis slender, bearing numerous primary side branches, the secondary branches of which bear the conidia; conidia hyaline or subhyaline, small, cylindrical, with a median septum which sometimes is difficult to see, sticking together in bundles by means of slime; saprophytic on wood and bark.

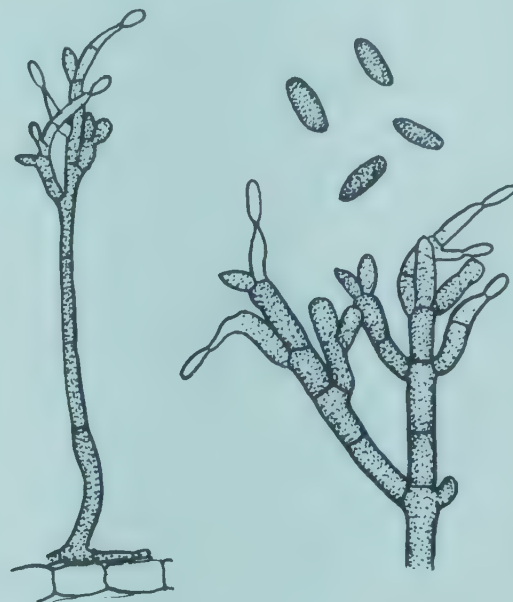
Fig. 199. *C. griseus*; A, group of conidiophores; B, conidiophore and conidia. Redrawn from Hughes (136).

200. DWAYAMALA Subram. Conidiophores erect, simple or branched, septate, brown, producing conidia on sporogenous cells; sporogenous cells simple, short, brown, produced at apex or on sides of conidiophore or its branches; conidia in simple or branched acropetalous chains from one or more points on the apex of the sporogenous cells, 2-celled, brown.

Fig. 200. *D. prathilomaka*; redrawn from Subramanian (259).



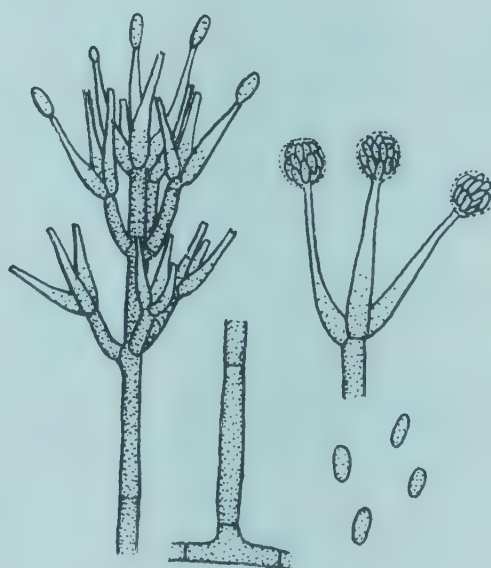
196. *Gonytrichum*



197. *Periconiella*



199. *Chaetopsis*



198. *Stachylidium*



200. *Dwayamala*

201. **CLADOSPORIUM** Link. Conidiophores dark, branched variously near the apex or middle portion, clustered or single; conidia dark, 1- or 2-celled, variable in shape and size, ovoid to cylindrical and irregular, some typically lemon-shaped; parasitic on higher plants or saprophytic.

Fig. 201. A, *C. fulvum*; original, from herbarium material on tomato leaf; B, *C. herbarum*; original, from fresh dead plant material. Reference (69).

202. **ASPERISPORIUM** Maubl. Stroma subepidermal in the host, bursting through the epidermis, bearing short crowded conidiophores; conidia dark, rough, 2-celled, produced as pushed out ends of new growing tips of conidiophores; parasitic.

Fig. 202. *A. caricae*; A, section through stroma and cluster of conidiophores; B, conidia. Redrawn from Hughes (148).

203. **SPILOCAEA** Fr. Mycelium subcuticular on the host, forming a stroma which bears upright conidiophores; conidiophores dark, 1-celled, short, markedly annulate near the tip due to the new conidia being pushed out through the apical conidial scars; conidia dark, typically 2-celled, although 1-celled conidia may predominate, broadly ovoid to pyriform or angled and pointed, with a truncate base; parasitic on higher plants; conidial stages of *Venturia*. Compare with *Fusicladium*.

Fig. 203. *S. pomi* (*Fusicladium dendriticum*, *Venturia inaequalis*); original; A, section through stroma; B, conidiophores and conidia from fresh material on apple leaf. Reference (148).

204. **FUSICLADIUM** Bon. Mycelium as in *Spilocaea*; conidiophores dark, short, denticulate with conidial scars, young conidia produced successively as pushed out ends of new growing tips; conidia dark, ellipsoid to pyriform, typically 2-celled, although 1-celled conidia may predominate; parasitic on higher plants. Compare with *Spilocaea*. Some species are conidial stages of *Venturia*.

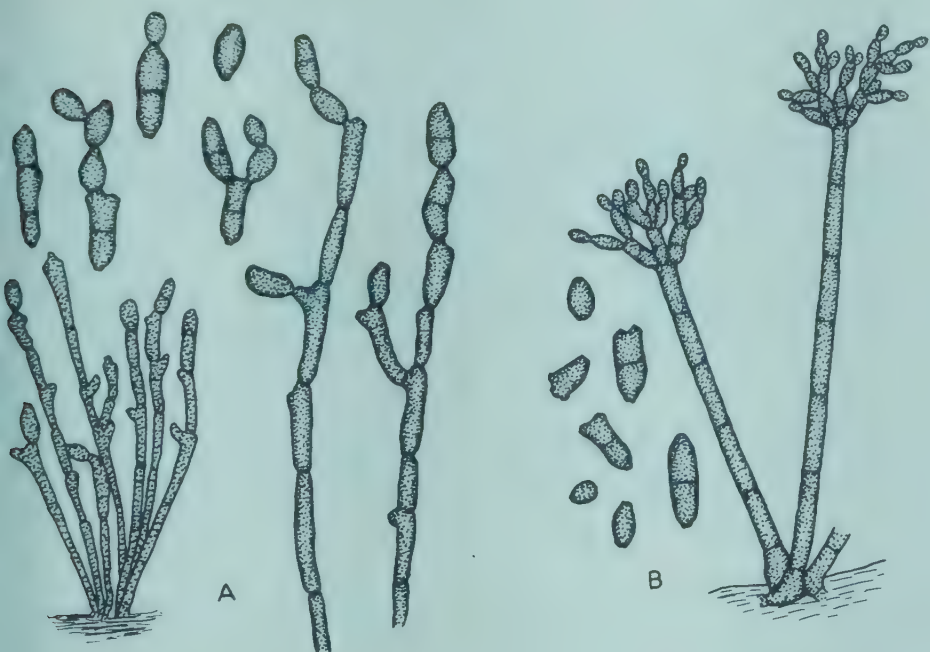
Fig. 204. *F. pirina* (*Venturia pirina*); original from herbarium material on pear leaf. Reference (148).

205. **PASPALOMYCES** Linder. Mycelium dark, producing both slender, upright, sterile hyphae and shorter conidiophores; upper portion of conidiophore made up of short spore-bearing cells; conidia light-colored, 2-celled, ellipsoid.

Fig. 205. *P. aureus*; A, conidiophores and sterile hyphae; B, conidiophore. Redrawn from Linder (180).

206. **SCOLECOTRICHUM** Kunze. Conidiophores in loose clusters, pigmented, simple bearing conidia terminally on pushed out ends of successive new growing points; conidia dark, 2-celled, ovoid or oblong, often pointed; parasitic.

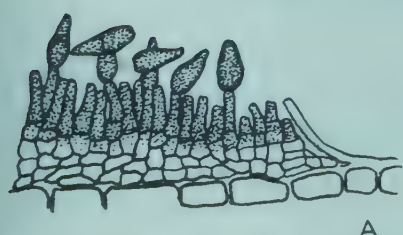
Fig. 206. *S. graminis*; original, from herbarium material on leaves of *Dactylis*. A, habit of conidiophores on leaf; B, C, clusters of conidiophores; D, conidia.



201. *Cladosporium*



202. *Asperisporium*



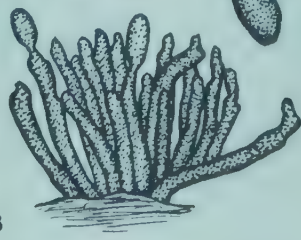
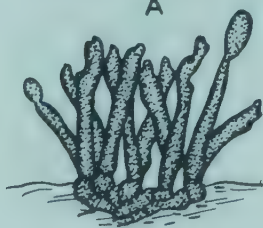
203. *Spilocaea*



204. *Fusicladium*



205. *Paspalomyces*



206. *Scolecotrichum*

207. PASSALORA Fr. Mycelium internal; conidiophores emerging in tufts, simple or branched, colored; conidia subhyaline to dark, 2-celled, formed terminally and singly as pushed out ends of new growing tips; parasitic.

Fig. 207. *P. baccilligera*; A, cluster of conidiophores arising from stroma; B, conidiophores; C, conidia. Redrawn from Hughes (148).

208. POLYTHRINCIUM Kunze and Schum. Conidiophores in dense clusters, dark, simple, bent irregularly, giving a wavy appearance; conidia dark, 2-celled, terminal, single; parasitic.

Fig. 208. *P. trifolii* (*Cymadothea trifolia*); original, from fresh material on white clover leaf. A, cluster of conidiophores on leaf; B, C, wavy conidiophores and conidia; B, partial top view; C, side view. References (142, 295).

209. DICOCCUM Corda. Conidiophores dark, short, 1-celled, clustered, bearing single spores terminally; conidia dark, 2-celled, ovoid or oblong, sometimes slightly curved; parasitic.

Fig. 209. *D. psoraleae*; original, from herbarium material on *Psoralea*. A, habit of conidiophores on leaf; B, conidiophores and immature conidia; C, conidia.

210. BISPORA Corda. Mycelium dark; Conidiophores dark, short, simple or sparingly branched; conidia dark, oblong, 2-celled or less often 3-celled, with thick black septa; catenulate, produced acropetally; saprophytic on wood.

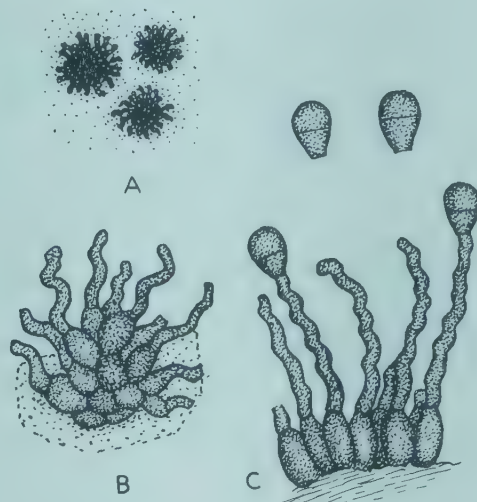
Fig. 210. *B. punctata*; original. A, E, conidiophores and conidia; B, C, conidiophores; D, conidia. A-D, from fresh material on wood; E, from culture.

211. CORDANA Preuss. Mycelium dark; conidiophores dark, upright, slender, simple, bearing a head of conidia; conidia dark, 2-celled, oblong to broadly ellipsoid; saprophytic.

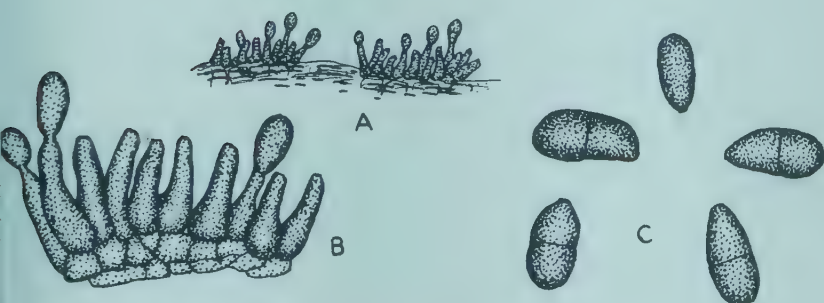
Fig. 211. *C. pauciseptata*; original, from culture. A, conidiophore with cluster of conidia; B, conidiophores; C, conidia. Reference (152).



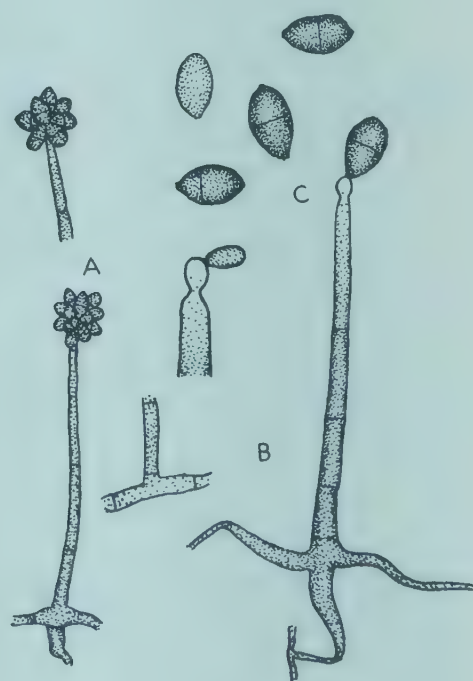
207. *Passalora*



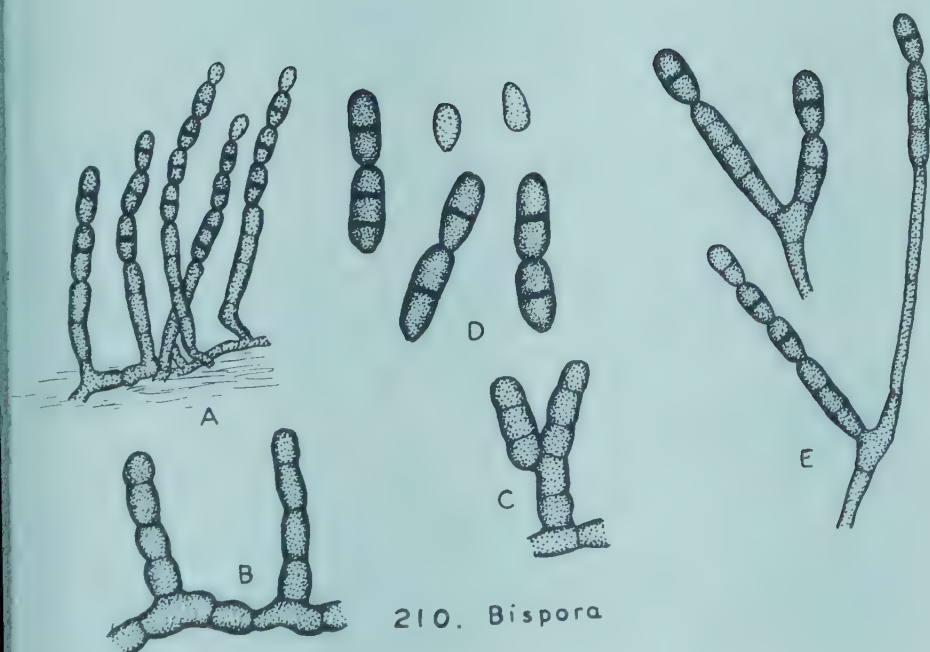
208. *Polythrincium*



209. *Dicoccum*



211. *Cordana*



210. *Bispora*

212. *CLADOTRICHUM* Corda. Conidiophores single or fascicled, erect, simple or rarely branched, cells constricted, brown; conidia 2-celled or rarely 4-celled, rarely branched, cells constricted, brown; conidia 2-celled or rarely 4-celled, rarely branched, cells constricted, produced apically or laterally, oblong-rounded, smooth, catenulate or held in small clusters, brown.

Fig. 212. *C. mangniferae*; redrawn from Batista (14).

213. *PSEUDOBOTRYS* Krzem. and Badura. (*Umbellula* Morris). Conidiophores dark, septate, radiately branched at the apex; tips of branches swollen, covered with warts or teeth on which conidia are borne; conidia 2-celled, dark; saprophytic.

Fig. 213. *P. terrestris*; A, redrawn from Subramanian (258); B, C, redrawn from Morris (201). Other reference (257).

214. *DWAYALOMA* Subram. Colonies superficial, subhyaline, intermixed with setae (spines); setae erect, simple, stiff, pointed, brown; conidia 2-celled, hyaline, cylindrical-oblong, single, each with one basal and one apical appendage which is forked.

Fig. 214. *D. trina*; redrawn from Subramanian (262).

215. *POLLACCIA* Bald. and Cif. Stroma within epidermal cells; conidiophores reduced to short, spore-bearing cells, which have inconspicuous annellations near the apex; conidia pigmented, 2- to 3-celled, oblong; parasitic, causing leaf spots.

Fig. 215. *P. radiosa*; A, B, stroma in epidermis of leaf; C, conidia. Redrawn from Hughes (148).

216. *RAMALIA* Batista. Mycelium superficial, septate, brown; conidiophores grouped, erect, wavy or irregular, simple, brown; conidia apical, single, at first hyaline, later dark, 2-celled.

Fig. 216. *R. veronicae*; redrawn from Batista (15).

217. *DEIGHTONIELLA* Hughes. Conidiophores arising from within epidermal cells, short, upper portion distinctly annellated; conidia dark, 3-celled, developing as successive apical proliferations through previous conidial scars; parasitic.

Fig. 217. *D. arundinacea*; A, conidiophores arising from epidermis of host; B, conidia. Redrawn from Hughes (148).

218. *TRICHOCLADIUM* Harz. Conidiophores poorly developed or lacking; conidia dark, transversely 1- to 4-septate, ovoid to ellipsoid, sometimes bent; saprophytic on wood.

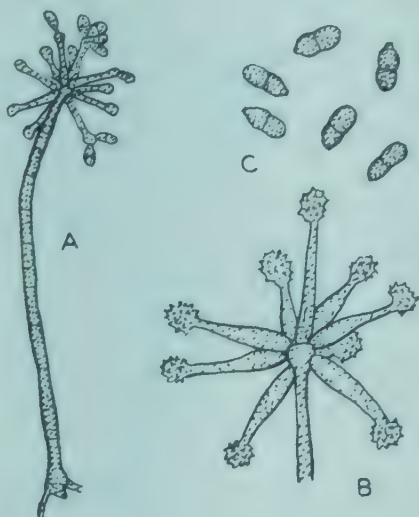
Fig. 218. *T. opacum*; redrawn from Hughes (143).

219. *PLEIOCHAETA* Hughes. Conidiophores simple, straight or bent; conidia dark, 4- to 7-celled, mostly 5-celled, cylindrical to ellipsoid, sometimes slightly curved, the middle cell thick-walled and darker, the cell on either and thin-walled and light, the apical cell pointed and bearing one to four long, slender, hyaline appendages; parasitic.

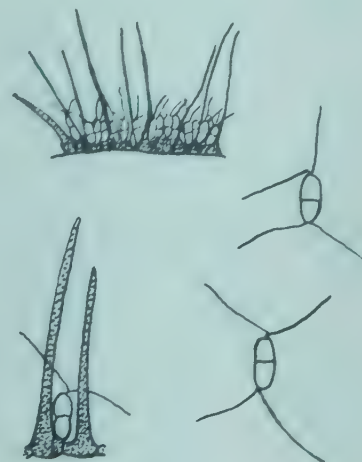
Fig. 219. *P. setosa*; redrawn from DuPleissis and Truter (88).



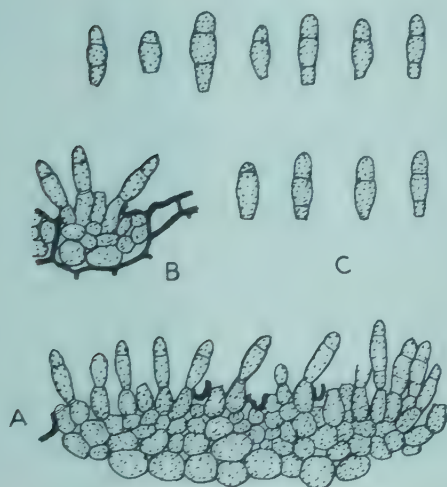
212. *Cladotrichum*



213. *Pseudobotrys*



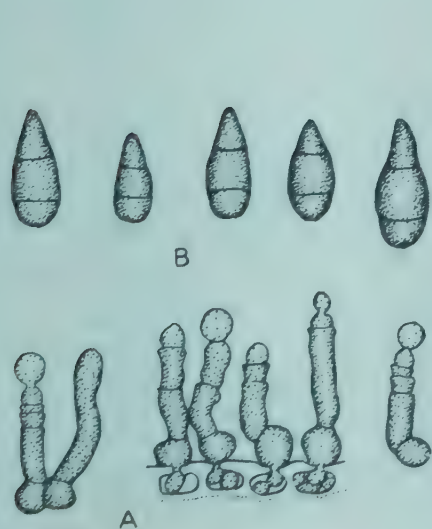
214. *Dwayaloma*



215. *Pollaccia*



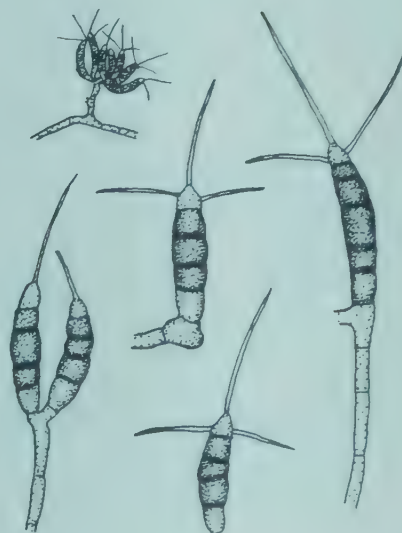
216. *Ramalia*



217. *Deightoniella*



218. *Trichocladium*



219. *Pleiochaeta*

220. CEPHALIOPHORA Thaxt. Conidiophores short, apex enlarged, nearly spherical, bearing a dense cluster of conidia on all sides; conidia dark, usually 4- or more-celled, obovoid to elongate, narrower at the base; saprophytic on dung or decaying plant materials.

Fig. 220. *C. tropica*; redrawn from Thaxter (280). Other reference (297).

221. PHRAGMOCEPHALA Mason and Hughes. Conidiophores pigmented, erect, simple, single, fascicled or in synnemata, each bearing a solitary apical conidium; conidia dark, more than 3-celled, ovoid to pyriform, cells unequally colored; saprophytic on dead plant material. Ellis (92) considers this genus as synonymous with *Endophragmia*.

Fig. 221. *P. cookei*; redrawn from Mason and Hughes (194).

222. ENDOPHRAGMIA Duvernoy and Maire. Conidiophores simple, erect, septate, brown, arising singly, in clusters, or sometimes forming synnemata, the wall of the lower part of a conidium frequently remaining attached at the apex of proliferating conidiophore as a cup; conidia 2- to several-celled, brown to black, sometimes with black bands at the septa, formed singly at apex, often becoming detached by tearing of wall of conidiophore beneath the conidium; saprophytic.

Fig. 222. *E. mirabilis*; original, from decayed wood. Reference (92).

223. SPONDYLOCLADIUM Mart. Conidiophores dark, simple, straight, septate, the upper cells bearing whorls of conidia; conidia dark, 3- or more-celled; parasitic or saprophytic.

Fig. 223. *S. obovatum*; original, from fresh material on decayed wood.
References (41, 234).

224. CACUMISPORIUM Preuss. Conidiophores dark, upright, septate, simple, bearing an apical head of conidia; conidia dark or hyaline, mostly 3-septate, oblong to fusoid, straight or curved, produced on protruding, hyaline projection of the conidiophore; near *Acrothecium*; saprophytic.

Fig. 224. *Cacumisporium* sp.; original, from decayed wood. Reference (149).

225. CAMPOSPORIUM Harkn. Conidiophores erect, straight or irregularly bent, septate, brown, paler near apex; conidia apical, single; cylindrical with rounded ends, pale brown, lighter at the ends, several-celled, apical cell frequently with 1 to 3 hyaline, filiform appendages.

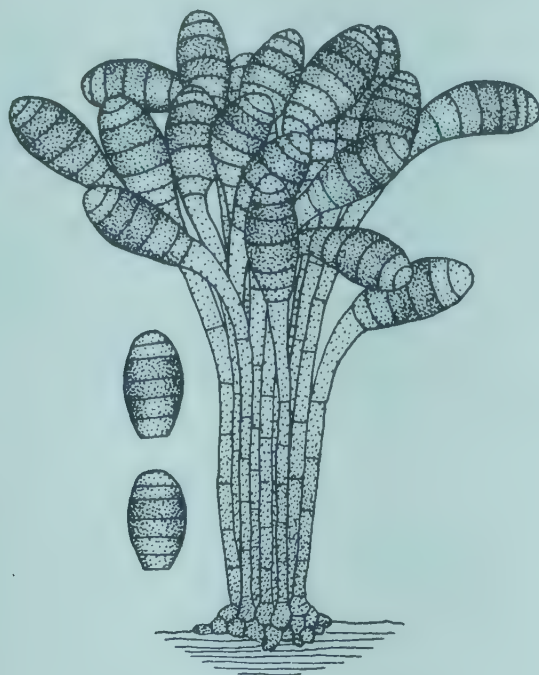
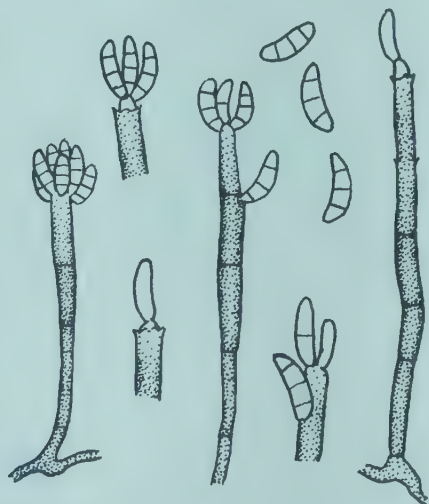
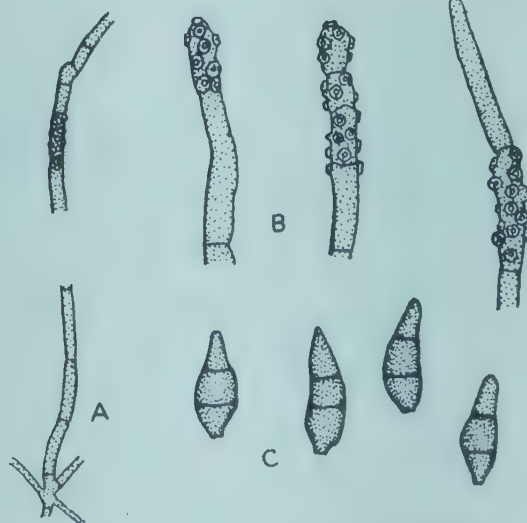
225. *C. antennatum*; redrawn from Tubaki (288).

226. BACTRODESMIUM Cooke. Conidiophores clustered (sometimes into sporodochia), simple or branched, hyaline to pale brown, narrow at base, septate; conidia several-celled, pale to dark brown, apical cells often darker, apical, single; saprophytic. This genus may more correctly be placed in the Tuberculariaceae.

Fig. 226. *B. abruptum*; redrawn from Ellis (92).

227. HANSFORDIELLA Hughes. Conidiophores erect, short or tall, pale brown, bearing terminal and lateral cup-like structures (circular scars) on which spores are produced; conidia 3- to 5-celled, brown at maturity, more or less obclavate; saprophytic, or parasitic on other fungi.

Fig. 227. *H. bakeri* redrawn from Subramanian (260). A, conidiophore; B, upper portions of conidiophores showing circular spore scars; C, conidia. Other reference (134).

220. *Cephaliophora*221. *Phragmocephala*222. *Endophragmia*223. *Spondylocladium*224. *Cacumisporium*225. *Camposporium*226. *Bactrodesmium*227. *Hansfordiella*

228. **HELMINTHOSPORIUM** Link. Mycelium light to dark in culture, extensive; conidiophores short or long, septate, simple or branched, more or less irregular or bent, bearing conidia successively on new growing tips; conidia dark, typically containing more than 3 cells, cylindrical or ellipsoid, sometimes slightly curved or bent, ends rounded; parasitic, frequently causing leaf spots of grasses.

Fig. 228. *H. sativum* (*Cochliobolus sativus*); original, from culture. References (73, 153).

229. **BRACHYSPORIUM** Sacc. Conidiophores brown, erect, usually solitary, simple, septate; conidia dark, ovoid to obovoid, unequally 3- or more-celled; attached to the apical cell of the conidiophore by a short, narrow cell; saprophytic on wood and bark.

Fig. 229. A, *B. obovatum*; B, *B. bloxani*; redrawn from Hughes (137).

230. **CURVULARIA** Boedijn. Conidiophores brown, simple or sometimes branched; bearing spores as in *Helminthosporium*; conidia dark, end cells lighter, 3- to 5-celled, more or less fusiform, typically bent or curved, with one or two of the central cells enlarged; parasitic or saprophytic.

Fig. 230. *C. lunata*; original, from culture. References (93, 244, 252).

231. **HETEROSPORIUM** Klotzsch. Conidiophores dark, simple, producing conidia as in *Helminthosporium*; conidia dark, typically 3- or more-celled, cylindrical, wall rough, echinulate to verrucose; parasitic, causing leaf spots or saprophytic.

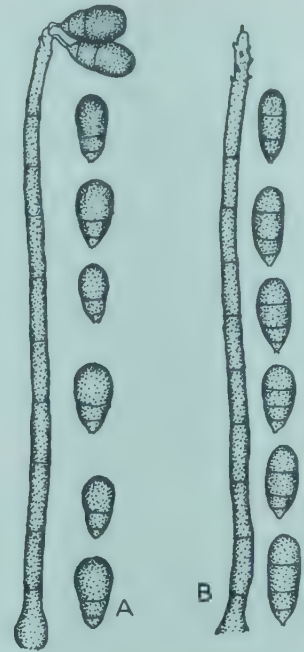
Fig. 231. *H. gracile*; original, from herbarium material on *Iris* leaf. Reference (166).

232. **SEPTONEMA** Corda. Conidiophores dark, simple or branched, tall or short, bearing conidia apically; conidia subhyaline to dark brown, typically 3- or several-celled; cylindrical to fusoid, catenulate in simple or branched chains, produced acropetally; saprophytic or parasitic.

Fig. 232. *S. secedens*; redrawn from Hughes (139). Other reference (145).



228. *Helminthosporium*



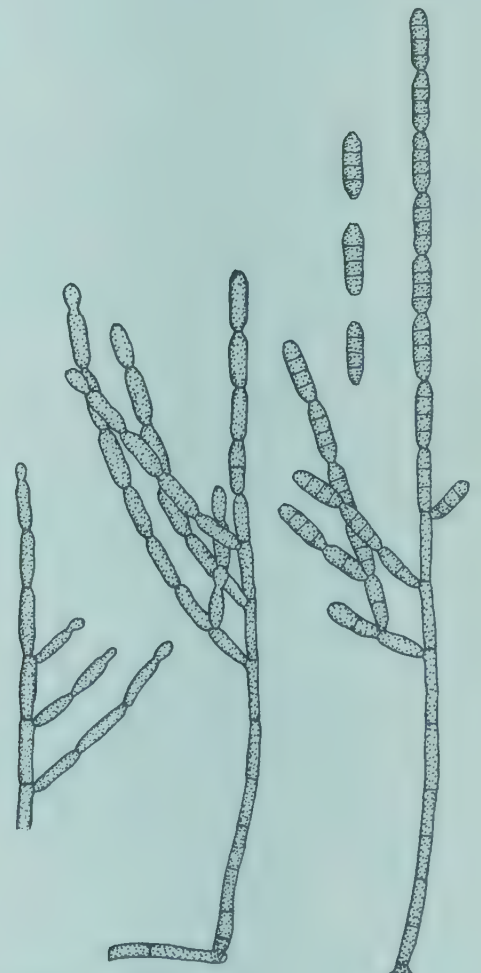
229. *Brachysporium*



230. *Curvularia*



231. *Heterosporium*



232. *Septonema*

233. PRATHIGADA Subram. (*Macraea* Subram). Conidiophores simple, non-septate, erect or bent, straight or wavy, subhyaline to brown, densely crowded; conidia apical, single, 2- to several-celled, broader at base, tapering upward, brown, paler near apex. (See Jour. Madras Univ. 26: 366, 1956).

Fig. 233. *P. crataevea*; redrawn from Subramanian (250).

234. EXOSPORIUM Link. Conidiophores closely aggregated, arising from a stroma, dark brown, simple, erect, septate; conidia apical, single, obclavate, dark brown, thick-walled, 3- to several-celled. See Hughes (153) for synonymy with *Helminthosporium* Link (*Helminthosporium* Link).

Fig. 234. *E. arecae*; redrawn from Subramanian (258). A, cluster of conidiophores; B, conidia.

235. BLODGETTIA Wright. Conidiophores simple, slender, hyaline to subhyaline, septate; conidia apical, single, several-celled, torulose, brownish, middle cells broader and darker; on vegetation in water.

Fig. 235. *B. indica*; redrawn from Subramanian (254).

236. HORMISCIELLA Batista. Mycelium superficial, dark, like *Hormiscium*, echinulate; conidiophores absent; conidia several-celled, brown, smooth, borne on short protuberances from mycelial cells; saprophytic.

Fig. 236. *H. atra*; redrawn from Batista (14).

237. BAHUSANDHIKA Subram. (*Polydesmus* Mont.). Conidiophores erect mostly simple, septate; conidia dark, mostly 3-celled, borne in acropetalous, simple or branched chains, connected by "separating cells"; saprophytic. (see Jour. Indian Bot. Soc. 35: 469, 1956).

Fig. 237. *B. indica*; redrawn from Subramanian (253).

238. EDMUNDMASONIA Subram. Conidiophores distinct, erect, simple, septate; conidia mostly 4-celled, brown, produced apically and singly on terminal and lateral phialides; saprophytic.

Fig. 238. *E. pulchra*; redrawn from Subramanian (264).

239. BACTRODESMIELLA M. B. Ellis. Conidiophores clustered (sometimes forming sporodochia), simple or branched, flexuous, subhyaline to pale brown, septate, wider toward apex; conidia mostly 3-celled, brown, single or in short chains, broadest near apex; saprophytic. This genus may more accurately be placed in the Tuberculariaceae.

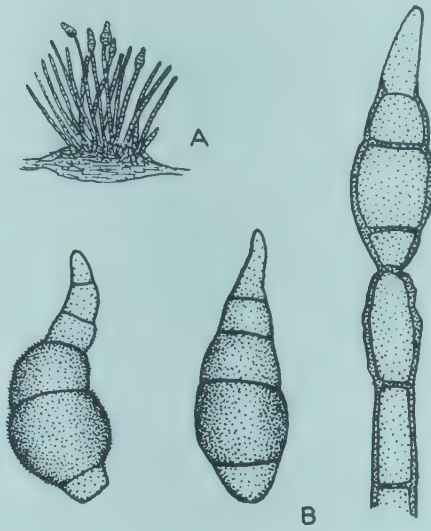
Fig. 239. *B. masonii*; redrawn from Ellis (92).

240. ANNELLOPHORA Hughes. Conidiophores brown, simple, straight or curved, septate, elongating by successive proliferations through the conidial scars; conidia brown, multiseptate, obclavate to fusoid; mycelium superficial on leaves.

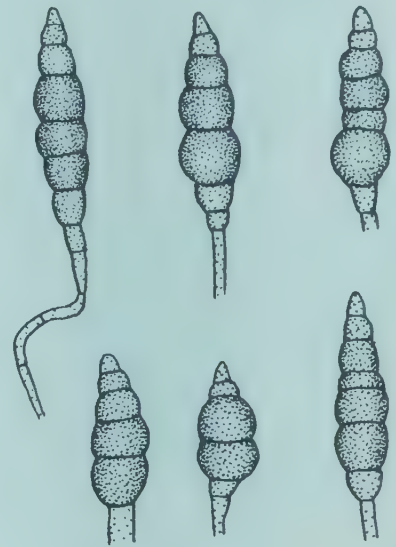
Fig. 240. *A. solani*; redrawn from Hughes (135). A, conidiophores showing proliferation through conidial scars; B, conidia.



233. *Prathigada*



234. *Exosporium*



235. *Blodgettia*



236. *Hormisciella*



237. *Bahusandhika*



238. *Edmundmasonia*



239. *Bactrodesmiella*



240. *Anellophora*

241. CERATOPHORUM Sacc. Conidiophores dark, short, simple, bearing a solitary, apical conidium; conidia dark, 3- to several-celled, fusoid to cylindrical, the apical cell drawn out to a slender hyaline, often curved or hooked appendage; saprophytic.

Fig. 241. *C. uncinatum*; original, drawn from herbarium material on *Hicoria* leaves. Reference (127).

242. CERCOSPORA Fres. Conidiophores dark, simple, arising in clusters and bursting out of leaf tissue, bearing conidia successively on new growing tips; conidia hyaline or dark, filiform, several-celled; parasitic on higher plants, commonly causing leaf spots. The genus differed from *Cercospora* in the pigmented conidiophores (and conidia).

Fig. 242. *C. apii*; original, from prepared slide of section through leaf. A, cluster of conidiophores; B, conidia. Reference (51).

243. STIGMINA Sacc. Conidiophores dark, rather short, simple, often arising in clusters from stroma-like tissue and protruding through stomata of leaves, producing a solitary conidium apically; conidia dark, typically 3- or more-celled, ovoid to ellipsoid; parasitic or saprophytic.

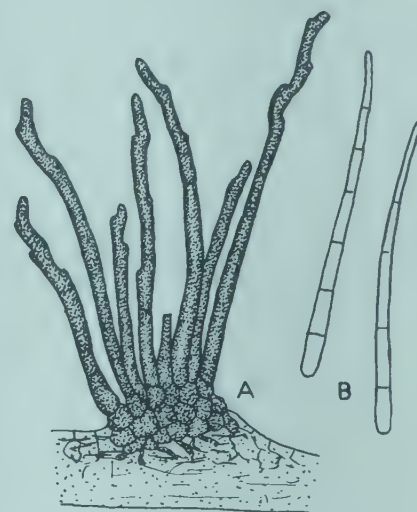
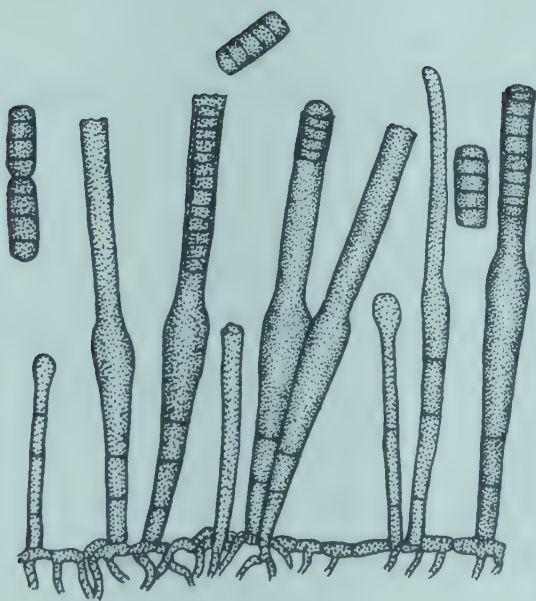
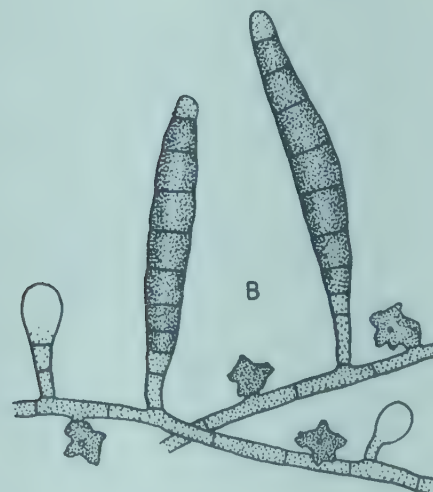
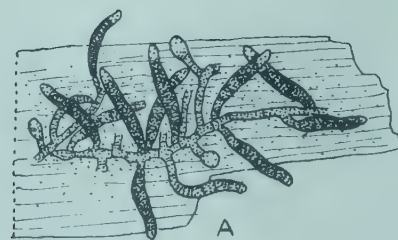
Fig. 243. *S. platani*; original, from herbarium material on leaves of *Platanus occidentalis*. A, section of leaf through clusters of conidiophores; B, conidiophores; C, conidia. References (142, 296).

244. SPOROSCHISMA Berk. and Br. Conidiophores dark, upright, stout, simple, bearing conidia endogenously; conidia dark, 3- or more-celled, cylindrical, sometimes in chains; saprophytic on decaying vegetation.

Fig. 244. *S. saccardoii*; original from culture. References (93, 126).

245. CLASTEROSPORIUM Schw. Mycelium superficial, bearing hyphopodia; conidiophores dark, short, 1-celled, bearing a single, apical conidium; conidia dark, 3- to several-celled, ovoid to long cylindrical, somewhat narrower at the ends, sometimes curved; parasitic on higher plants.

Fig. 245. *C. caricinum*; original, from herbarium material on leaves of *Carex*. A, habit of fungus on leaf; B, conidiophores and conidia. References (91, 92, 199).

241. *Ceratophorum*242. *Cercospora*243. *Stigmina*244. *Sporoschisma*245. *Clasterosporium*

246. *DENDRYPHIOPSIS* Hughes. Conidiophores dark, stout, upright, dendritically branched, ultimate branches producing solitary conidia; conidia dark, 4- or more-celled, cylindrical, straight or slightly curved; saprophytic.

Fig. 246. *D. atra*; original. A, B, from fresh material on decayed wood; C, from pure culture isolated from decayed wood. Reference (149).

247. *DICHOTOMOPHTHORA* Mehrlich and Fitzpatrick. Conidiophores brown, branching dichotomous to subdichotomous, elongated, terminal branches 4-8 lobed, each lobe bearing a single conidium; conidia dark, ovoid to elongate-ovoid, 1- to 6-celled; parasitic on *Portulaca*.

Fig. 247. *D. portulacae*; redrawn from Mehrlich and Fitzpatrick (195).

248. *SPONDYLOCLADIELLA* Linder. Conidiophores dark, branched; phialides appear as short, stubby branches, single or in groups; conidia dark, mostly 3-celled, oblong, borne singly; saprophytic.

Fig. 248. *S. botrytioides*; redrawn from Linder (181).

249. *FUSARIELLA* Sacc. Conidiophores pigmented, typically branched, bearing conidia terminally; conidia dark, 3- or more-celled, cylindrical, curved, borne in chains, not end to end, each conidium attached at the side of the conidium below; saprophytic on plant material.

Fig. 249. *F. obstipa* (*Dendryphium obstipum*); drawn from photographs by Pollack (213). Other reference (125).

250. *SPORIDESMIUM* Link. Conidiophores simple, septate, brown; conidia several-celled, apical, single, dark, obclavate or fusoid. the apical cells smaller; saprophytic.

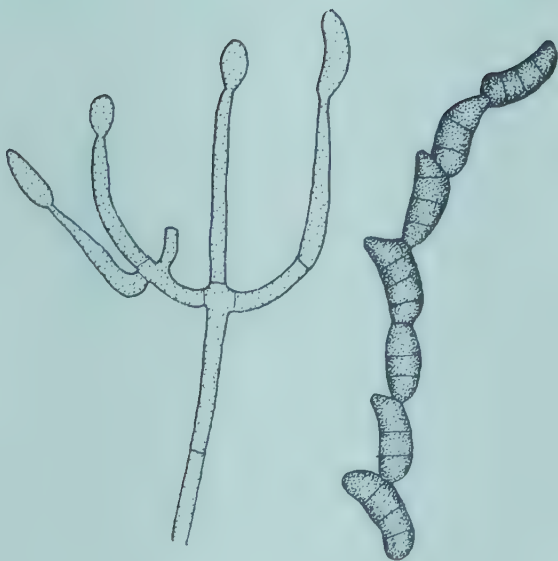
Fig. 250. *S. densum*; redrawn from Hughes (149).



246. Dendryphiopsis

247. Dichotomophthora

248. Spondylocladiella



249. Fusariella



250. Sporidesmium

251. PSEUDOTORULA Subram. Conidiophores erect, simple, septate, torulose, each with an apical rounded sporogenous cell; conidia of two types, brown, 4-celled spores (phragmospores) in simple or branched acropetalous chains, and long slender, several-celled spores (scolecospores).

Fig. 251. *P. heterospora*; redrawn from Subramanian (263). A, conidiophore and phragmospores; B, conidia with both types of spores; C, scolecospore.

252. DWAYABEEJA Subram. Conidiophores erect, simple or branched, septate, producing conidia on distinct, rounded, sporogenous cells; conidia of two types, phragmospores not in chains, and long, several-celled brown scolecospores.

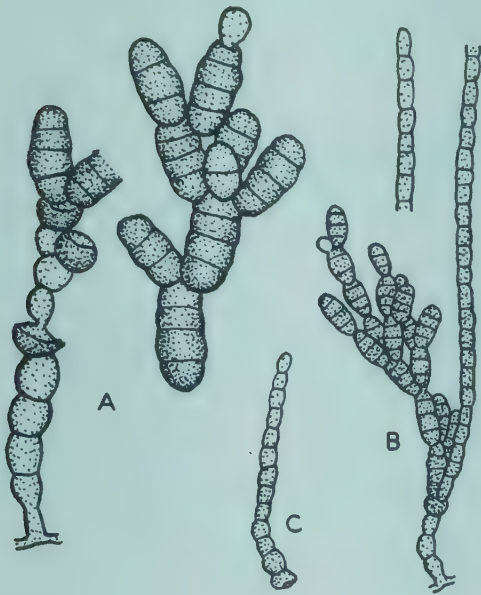
Fig. 252. *D. sundara*; redrawn from Subramanian (263). A, conidiophore; B, phragmospores; C, scolecospores.

253. LOMAANTHA Subram. Conidiophores simple, septate, erect; conidia several-celled, brown, apical, single, obclavate, with subhyaline, filiform apical and lateral appendages arising from apical cell; saprophytic.

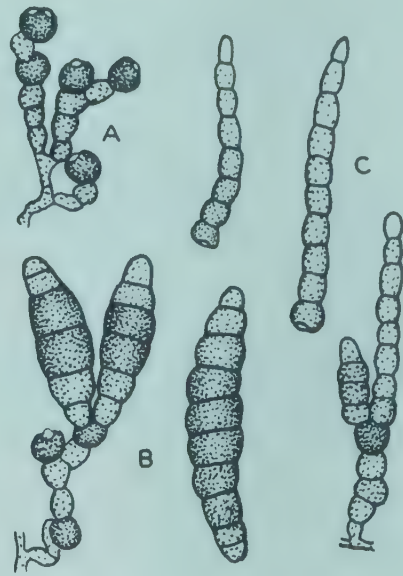
Fig. 253. *L. pooga*; redrawn from Subramanian (253).

254. DENDRYPHION Wallr. Conidiophores erect, branched variously on upper portion, spore scars prominent; conidia several-celled, dark, catenulate, attached apically and laterally; saprophytic.

Fig. 254. *D. laxum*; redrawn for Subramanian (251).



251. *Pseudotorula*



252. *Dwayabeeja*



253. *Lomaantha*



254. *Dendryphion*

255. ACROSPEIRA Berk. and Br. Conidiophores simple, dark, variable; conidia apical, single, mostly 3- or 4-celled, cells arranged irregularly, apical cell enlarged, darker; also hyaline phialides present, borne singly and producing chains of small, ovoid, hyaline spores.

Fig. 255. *A. mirabilis*; redrawn from Wiltshire (293). A, dark dictyospores; B, phialides and chains of small conidia.

256. DICTYOARTHRIUM. Conidiophores simple, crowded, straight or curved, subhyaline, with thick, dark septa; conidia 4-celled; cross-shaped, dark brown, apical and lateral on conidiophore; saprophytic.

Fig. 256. *D. quadratum*; redrawn from Subramanian (250). Other reference (141).

257. TETRACOCOCCOSPORIUM Szabo. Conidiophores indefinite or none; conidia arising as lateral swellings on mycelium, 4-celled, cross-shaped, dark, smooth.

Fig. 257. *T. quadratum*; redrawn from Wiltshire (293).

258. CONIOTHECIUM Corda. Conidiophores short or none; conidia dark, muriform, many-celled, irregular; saprophytic on decaying wood.

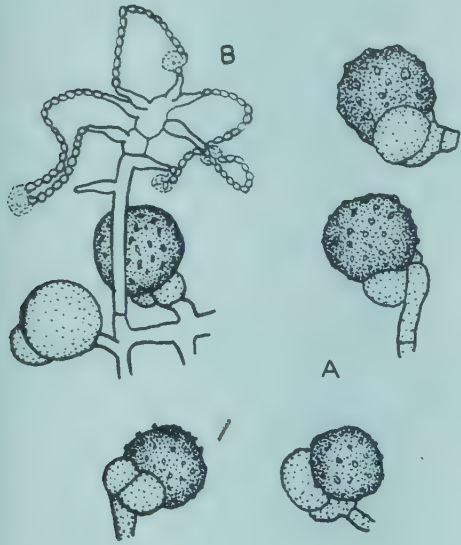
Fig. 258. *C. perplexum*; original, from herbarium material on decaying wood. A, B, habit on wood; C, conidia.

259. DICTYODESMIUM Hughes. Conidiophores very short, crowded in erumpent pustules on leaves; conidia single, apical, fusoid with tapering ends, with several transverse and a few longitudinal septa, middle portion brown, subhyaline toward the ends; parasitic on leaves.

Fig. 259. *D. ulmicola*; redrawn from Hughes (127).

260. PIRICAUDA Bubak em. Moore. Conidiophores simple, composed of several cells or reduced to a peg; conidia dictyosporous, dark, single, apical, globose or elliptical or cylindrical to obovoid, cells irregular in shape.

Fig. 260. *P. quadrata* (*Stigmella crataegi*); original from herbarium material on leaves of *Crataegus*. A, B, conidiophores and conidia in section of leaf; C, conidia. References (91, 142, 199, 200).



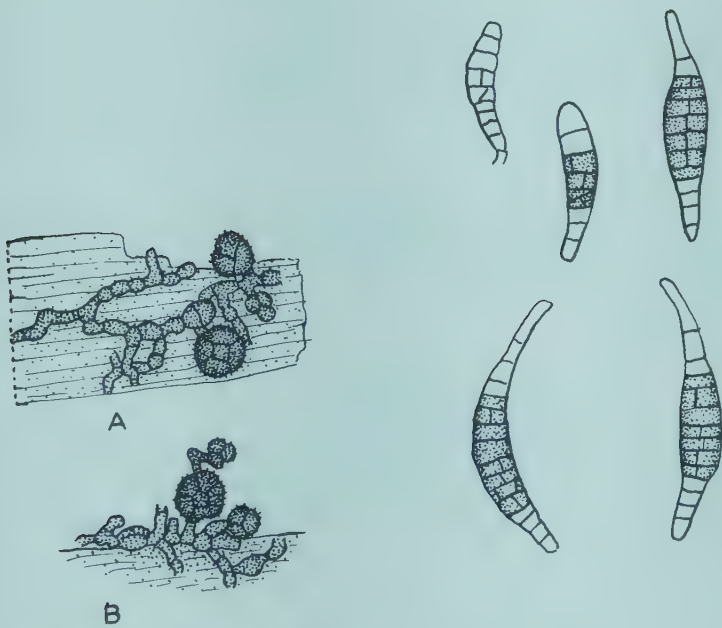
255. *Acrospeira*



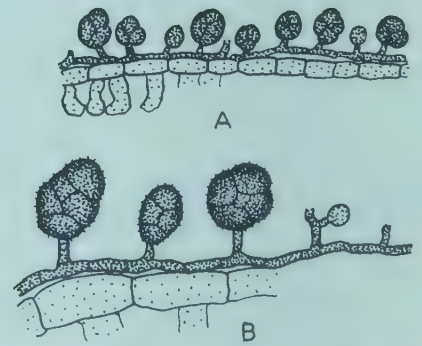
256. *Dictyoarthrinium*



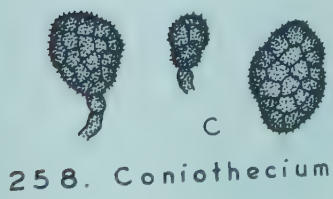
257. *Tetracoccusporium*



259. *Dictyodesmium*



260. *Piricauda*



258. *Coniothecium*

261. *TRICHAEGUM* Corda. Conidiophores dark, simple, in clusters, bearing conidia laterally near the base; conidia dark, globose, several-celled, septations variable; saprophytic on decaying vegetable matter.

Fig. 261. *T. nodulosum*; original, from herbarium material on leaves of *Carex*. A, clusters of conidiophores on portion of leaf; B, conidiophores and conidia; C, conidia.

262. *SIRODESMIUM* de Not. Conidiophores dark, densely clustered, arising from a stroma, bearing terminal chains of conidia; conidia dark, elongate, septate, sometimes with longitudinal walls, borne in simple or branched chains, developing basipetally; saprophytic on wood.

Fig. 262. *S. granulosum*; original, from herbarium material on decaying wood. A, habit on wood; B, clusters of conidiophores; C, conidiophore and conidia. References (147, 181).

263. *BERKLEASMIUM* Zobel. Conidiophores clustered forming a loose sporodochium, dark, short, simple, each bearing a terminal conidium; conidia dark, large, containing many cells irregularly arranged, oblong to obovoid; saprophytic on decaying wood.

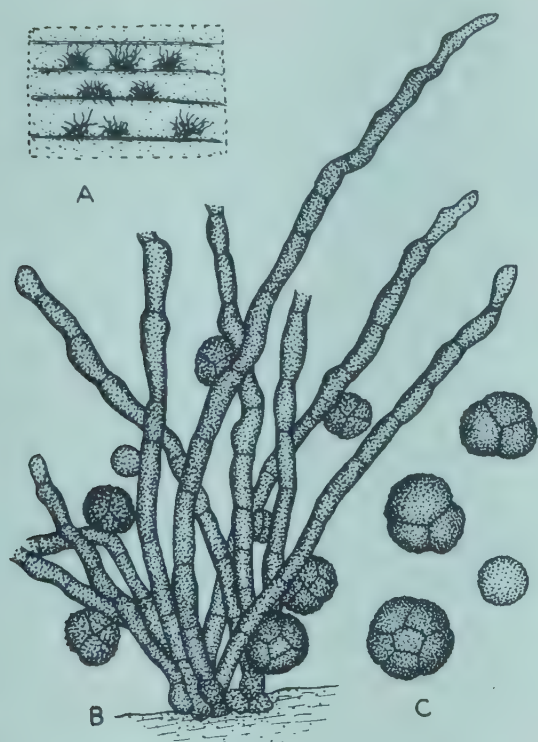
Fig. 263. *B. concinnum*; original, from herbarium material on decayed wood. A, habit of fungus on wood; B, conidiophores and conidia; C, conidium. References (91, 199).

264. *FUMAGO* Pers. Mycelium dark, creeping over surface of leaves; conidiophores dark, variable, several-celled, dark, with cross and longitudinal septa, frequently in chains; saprophytic often on "honey dew" from aphids, called "sooty molds"; probably conidial stages of *Capnodium* and *Meliola*.

Fig. 264. *F. vagans*; original, from herbarium material on leaves.

265. *SARCINELLA* Sacc. Conidiophores short or indistinct; conidia of two kinds, irregular dark, muriform conidia and subhyaline falcate conidia; saprophytic; probably imperfect stage of *Dimerosporium*.

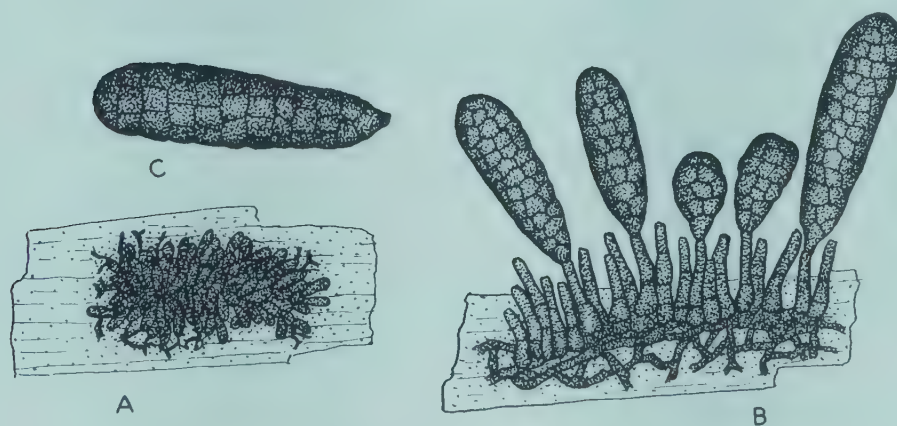
Fig. 265. *S. heterospora*; original, from herbarium material on leaves of *Rhus*.



261. *Trichaegum*



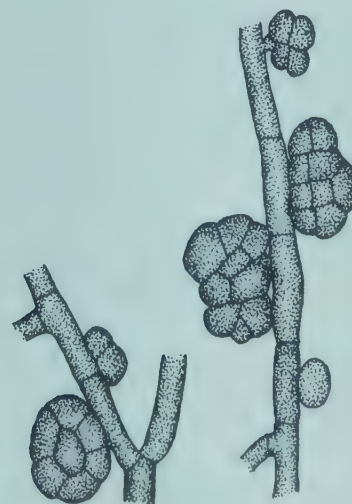
262. *Sirodesmium*



263. *Berkleasmium*



264. *Fumago*



265. *Sarcinella*

266. *ALTERNARIA* Nees. Conidiophores dark, simple, rather short or elongate, typically bearing a simple or branched chain of conidia; conidia dark, typically with both cross and longitudinal septa; variously shaped, obclavate to elliptical or ovoid, frequently borne acropetally in long chains, less often borne singly and having an apical simple or branched appendage; parasitic or saprophytic on plant material.

Fig. 266. A, *Alternaria* sp.; B, *A. solani*; both original, from culture. Reference (167, 203).

267. *DACTYLOSPORIUM* Harz. Conidiophores dark, simple, paler at the tip, bearing conidia successively from new growing tips; conidia brown to subhyaline, ovoid, sometimes inequilateral, with cross and longitudinal or oblique septa; saprophytic.

Fig. 267. *D. macropus*; redrawn from Hughes (146).

268. *STEMPHYLIUM* Wallr. Conidiophores dark, mostly simple, short to long, bearing a single, terminal conidium, or successive conidia on new growing tips, conidiophore proliferating through old conidial scar; conidia dark, with cross and longitudinal septa, variable in shape, frequently globose to broadly ellipsoid, or ovoid, smooth, verrucose or echinulate; parasitic or saprophytic.

Fig. 268. *S. sarcinaeforme*; original, from culture. References (200, 203, 293).

269. *TRIPOSPORIUM* Corda. Conidiophores dark, simple, septate, bearing a single conidium apically; conidia dark, with three septate arms radiating from a central cell; parasitic on leaves, or saprophytic on plant material.

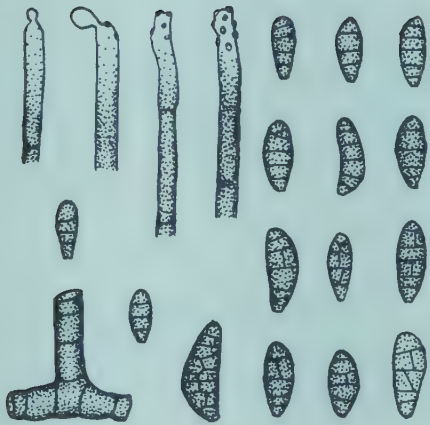
Fig. 269. *T. elegans*; redrawn from Ellis (93). Other references (133, 144).

270. *DESMIDIOSPORA* Thaxt. Conidia of two types; macroconidia dark, somewhat disk-shaped and lobed on the margin; microconidia hyaline, fusoid, borne terminally on acicular conidiophore with a swollen base; on insects; the microconidial stage appears to be similar to *Hirsutella*.

Fig. 270. *D. myromecophida*; A, mature macroconidia; B, immature macroconidia; C, microconidia on conidiophores; redrawn from Thaxter (277).



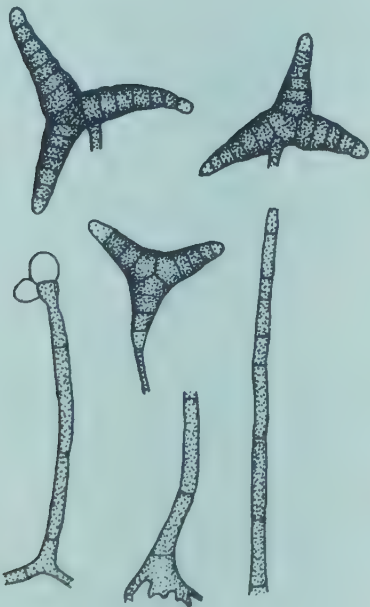
266. *Alternaria*



267. *Dactylosporium*



268. *Stemphylium*



269. *Triposporium*



270. *Desmidiospora*

271. SPEIROPSIS Tubaki. Conidiophores erect, simple, straight, septate; conidium single, apical, consisting of a basal cell and 3 to 5 somewhat divergent arms, each arm consisting of an acropetalous chain of cells, pale brown.

Fig. 271. *S. pedataspora*; redrawn from Tubaki (288).

272. ORBIOMYCES Linder. Aerial mycelium dark, septate; conidiophores absent; conidia borne on short, lateral teeth on mycelium, globose, shiny-black, bearing a crown of 3 or 4 dark, finger-like, lateral appendages attached to the base of a central appendage; saprophytic, on wood from sea water.

Fig. 272. *O. spectabilis*; redrawn from Barghoorn and Linder (11).

273. IYENGARINA Subram. Conidiophores simple or sparingly branched, septate, brown; conidia apical, single, Y-shaped, septate, brown, the two conidial arms divergent, arising from the forks of the main body of the conidium, ending in filiform tips; successive conidia produced on new growing points of conidiophore.

Fig. 273. *I. elegans*; redrawn from Subramanian (264).

274. DIPLOCLADIELLA Arnaud. Conidiophores erect, producing apical and lateral conidia; conidium consisting of two septate arms radiating from the basal cells; central cells dark, apical and basal cells hyaline; saprophytic.

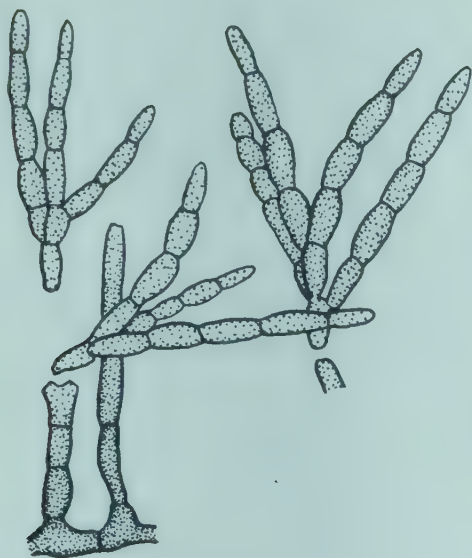
Fig. 274. *D. scalaroides*; redrawn from Tubaki (288).

275. HIRUDINARIA Ces. Mycelium mostly superficial, subhyaline; conidiophores reduced to short lateral swellings on the mycelium, brown; conidia consisting of 2 (less often 3) straight or curved arms (horns) tapering upward, several-celled, dark; parasitic on leaves.

Fig. 275. *H. macrocarpa*; original, from herbarium material on *Crataegus* leaves. Reference (129).

276. CERATOSPORIUM Schw. Conidiophores consisting of a short cylindrical cell; conidia consisting of 2 or 3 straight or curved arms (horns), tapering upward, several-celled, dark; saprophytic, on wood or bark.

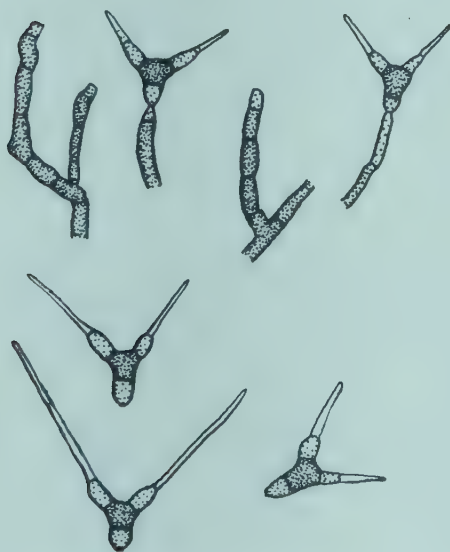
Fig. 276. *C. fuscescens*; redrawn from Hughes (129).



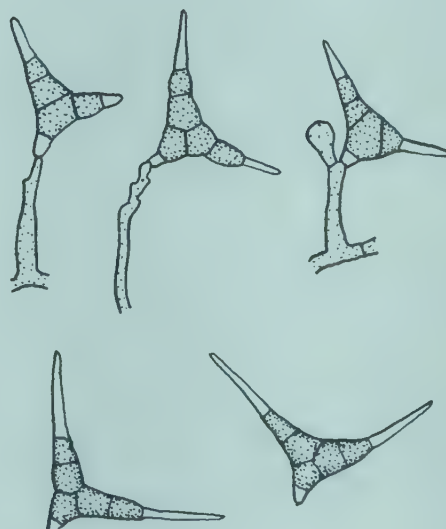
271. *Speiropsis*



272. *Orbiamyces*



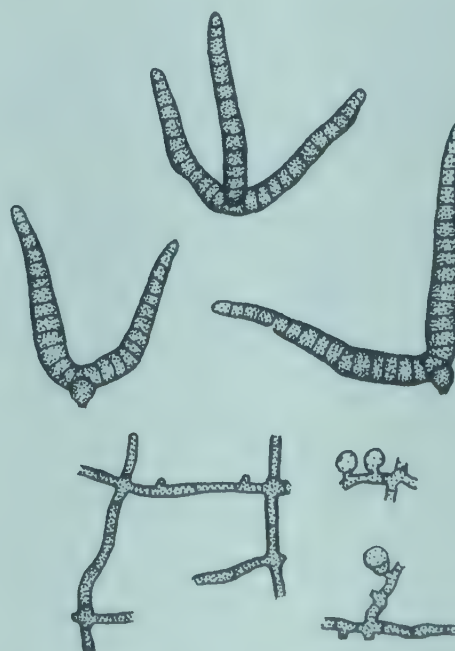
273. *Iyengarina*



274. *Diplocladiella*



275. *Hirudinaria*



276. *Ceratosporium*

277. TETRAPLOA Berk and Br. Conidiophores absent; conidia borne directly on mycelium, each consisting of 3 or 4 initial cells, each of which develops into a long attenuated, septate appendage, smooth or rough, brown; saprophytic.

Fig. 277. A, B, *T. aristita*; C, *T. ellisii*; redrawn from Ellis (90).

278. DICTYOSPORIUM Corda. Colonies black, irregular; conidiophores in clusters, much like sporodochia; conidia pale brown, cylindrical, narrowed toward the apex, consisting of 3 to 7 parallel branches arising from a single cell; branches multi-septate; saprophytic; much like *Speira*, but with spore branches connected.

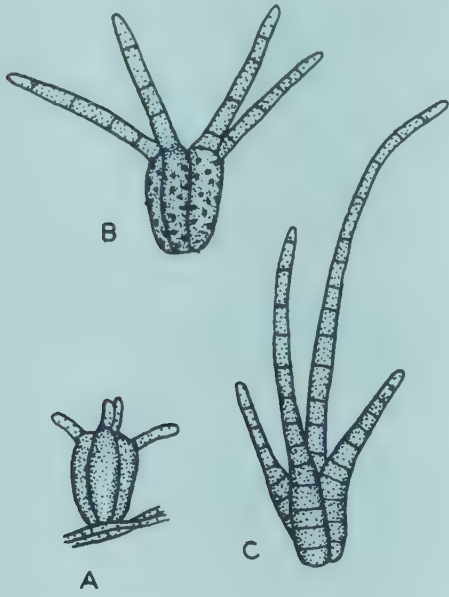
Fig. 278. *D. prolificum*; redrawn from Subramanian (251). Other reference (63).

279. CERATOSPORELLA Hohn. Conidiophores dark, simple, upright, bearing single conidia successively by protrusion of conidiophore through old conidial scars; conidia dark, composed of 2 or more septate branches, each arising separately from a basal cell; saprophytic.

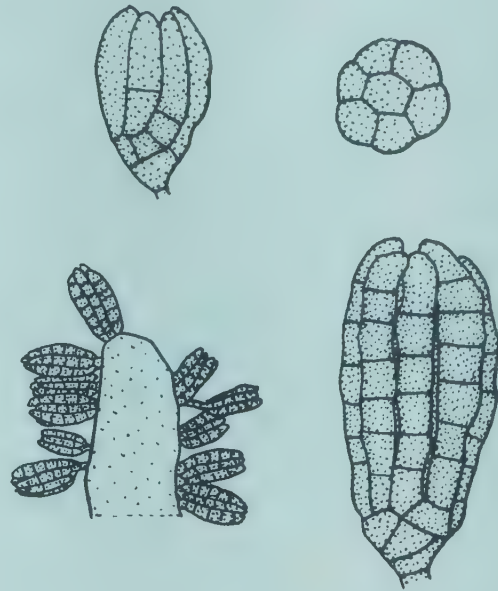
Fig. 279. *C. stipitata*; redrawn from Hughes (144). Other reference (133).

280. SPEIRA Corda. Conidiophores dark, simple or branched, usually short bearing a single branched spore apically; sometimes arranged in sporodochia; conidia with several close branches arising from different points (branches do not all arise separately from a basal cell); saprophytic. See Hughes (148) for synonymy with *Dictyosporium*.

Fig. 280. A, *S. toruloides*; redrawn from Ellis (93); B, *Speira* sp.; original from material on decayed wood. Other references (133, 144).



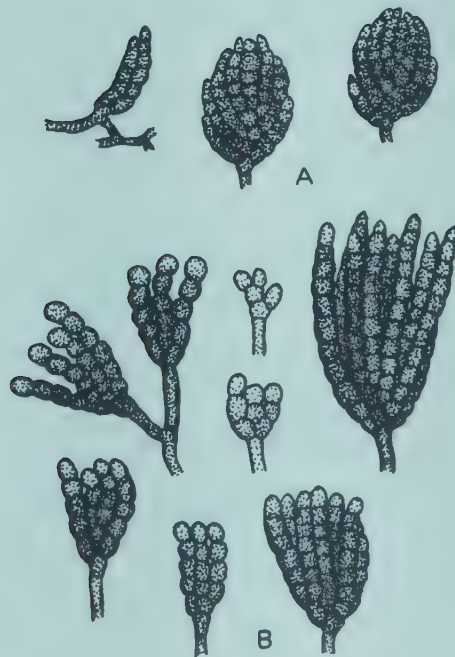
277. *Tetraploa*



278. *Dictyosporium*



279. *Ceratosporella*



280. *Speira*

281. *HORMIOKRYPTIS* Bat. and Nasc. Mycelium superficial, effuse, brown; composed of short, rounded cells, without distinct conidiophores; conidia sessile, cruciform (4-armed), many-septate, brown, smooth.

Fig. 281. *H. librocedri*; redrawn from Batista and Nascimento (20). A, B, portions of mycelium bearing conidia; C, conidium.

282. *HEPTASTER*. Mycelium superficial, dark; conidiophores simple, septate, brown; conidia apical, single, branched, with 6 radiating arms, irregular, many-celled, brown; foot cell oblong, brown; on leaves.

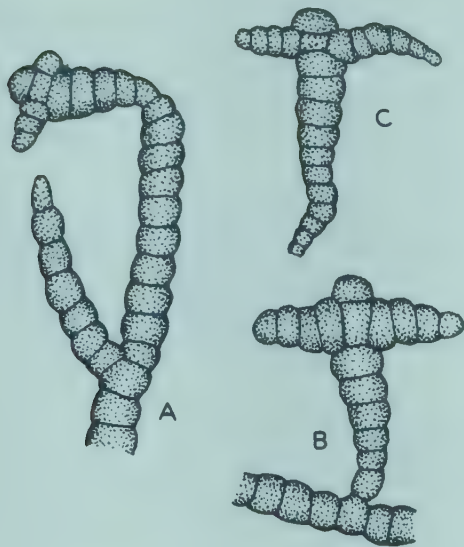
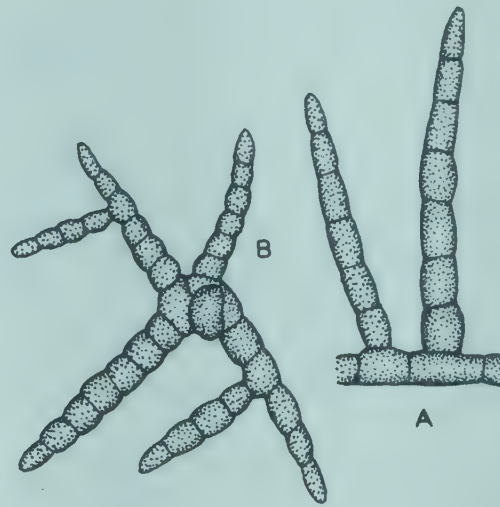
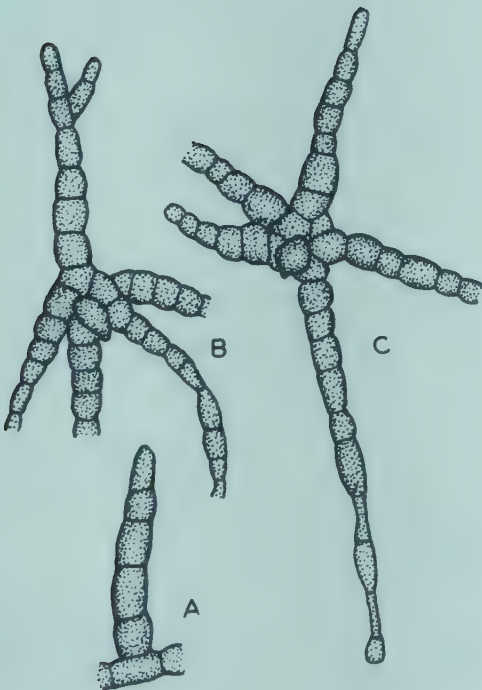
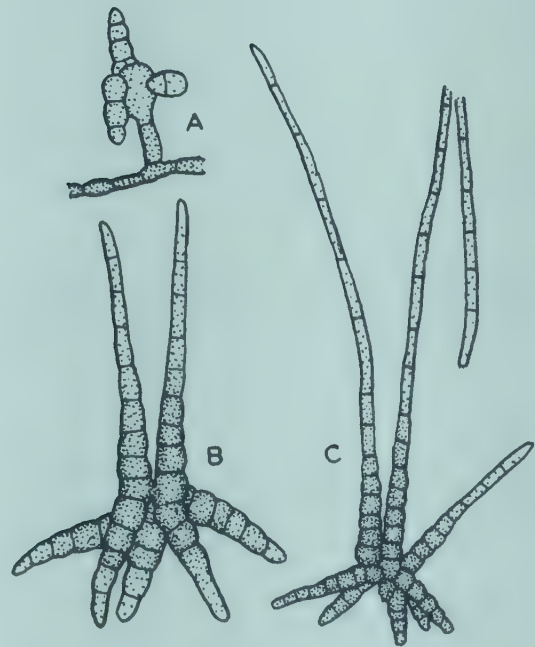
Fig. 282. *H. regnellianae*; redrawn from Batista (15). A, conidiophores; B, conidium.

283. *PENTASPORIUM* Batista. Conidiophores erect, septate, brown, arising laterally from brown mycelium; conidia irregularly star-shaped, with 5 radiate, divergent arms, each several-celled, elongate, brown at maturity; foot cell oblong-conical.

Fig. 283. *P. fourcroyae*; redrawn from Batista (15). A, conidiophore; B, C, conidia.

284. *MEGASTER* Ciferri. Mycelium dark, superficial; conidiophores short, inflated, simple; conidia stellate, with about 6 divergent, many-celled arms, some of which become elongated and attenuated, dark but attenuated portions lighter.

Fig. 284. *M. longicornis*; redrawn from Ciferri *et al.* (52). A, conidiophore and young conidium; B, C, immature and mature conidia.

281. *Hormiokrypsis*282. *Heptaster*283. *Pentasporium*284. *Megaster*

285. **TUBERCULARIA** Tode. Sporodochia rather large, light to orange in color, breaking out through the bark; conidiophores hyaline, elongate, repeatedly branched, not verticillately, bearing conidia terminally; conidia hyaline, 1-celled, ovoid to elongate, in a dry mass on the surface of the sporodochium; mostly saprophytic on wood.

Fig. 285. *T. vulgaris* (*Nectria cinnabarina*); original, from dried material on twigs; A, sporodochia on twig; B, section through sporodochium; C, conidiophores and conidia.

286. **NALANTHAMALA** Subram. Sporodochia superficial, sessile or stipitate, hemispherical to subglobose, composed of hyaline, closely packed tissue covered with conidiophores; conidiophores repeatedly branched, septate, hyaline, terminating in hyaline phialides; conidia 1-celled, hyaline, produced in simple basipetal chains ellipsoid or ovoid; saprophytic.

Fig. 286. *N. madreeya*; redrawn from Subramanian (259). A, section through sporodochium; B, conidiophores and conidia.

287. **ILLOSPORIUM** Mart. Sporodochia cushion-like, light colored; conidiophores hyaline, branched, phialides bearing conidia apically; conidia hyaline, ovoid to oblong collecting on the surface of the sporodochium in gelatinous material; parasitic or saprophytic on leaves, frequently as a secondary invader.

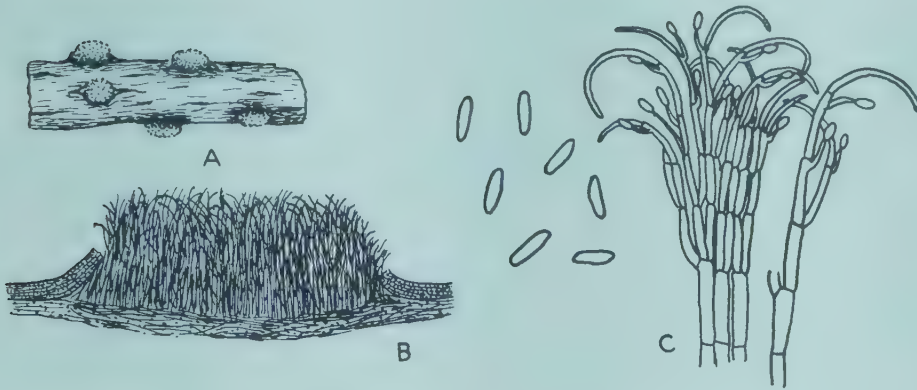
Fig. 287. *I. malifoliorum*; original, from dried material on apple leaves. A, B, sporodochia and masses of conidia; C, conidiophores and conidia.

288. **HYMENULA** Fr. Sporodochia somewhat flattened or discoid, light colored; conidiophores hyaline, sparingly to moderately branched, bearing terminal conidia; conidia hyaline, 1-celled, ovoid to oblong, collecting in a dry mass (not in slime) on sporodochium; saprophytic.

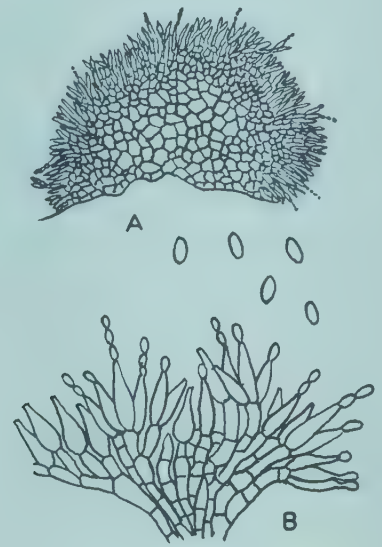
Fig. 288. *H. cerealis*; original, from herbarium material on wheat straw. A, B, sporodochia; C, conidiophores and conidia.

289. **KUTILAKESA** Subram. Sporodochia superficial, sessile or stipitate, setose; setae simple, brown, septate, coiled above, with blunt apex; conidiophores simple, hyaline, septate, terminating in one or more phialides; conidia apical, single, 1-celled, hyaline; saprophytic.

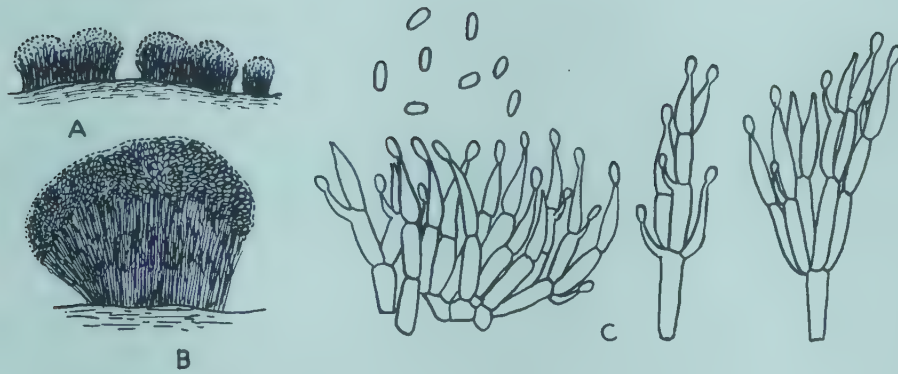
Fig. 289. *K. madreeya*; redrawn from Subramanian (259). A, B, sporodochia; C, conidiophore and setae; D, conidia.



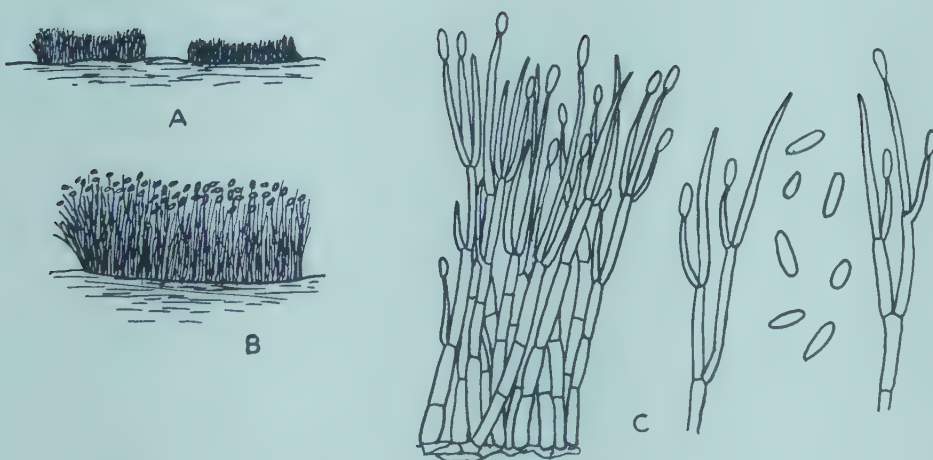
285. Tubercularia



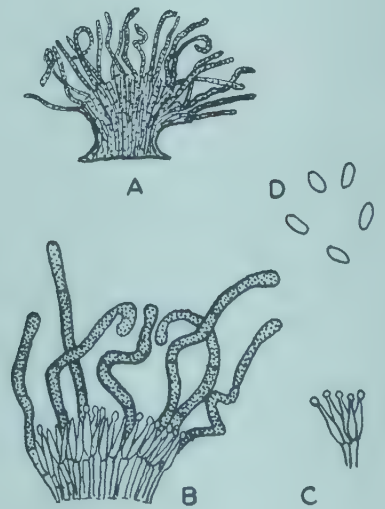
286. Nalanthamala



287. Illosporium



288. Hymenula



289. Kutilakesa

290. MYROTHECIUM Tode. Sporodochia cushion-like, light colored to dark, sometimes with marginal hyaline setae; conidiophores subhyaline or green to colored, repeatedly branched, bearing conidia terminally; conidia subhyaline to dark, 1-celled ovoid to elongate, dry in mass; parasitic or saprophytic.

Fig. 290. *M. roridum*; original, from herbarium material on leaf of *Viola*. A, sporodochium; B, conidiophores and conidia. References (98, 214, 215).

291. DENDRODOCHIUM Bon. Sporodochia cushion-like, light, bursting out of bark; conidiophores hyaline, verticillately branched, phialides in terminal whorls, bearing conidia terminally; conidia hyaline, 1-celled, ovoid to oblong, dry in mass; saprophytic on bark.

Fig. 291. *D. rubellum* var. *microsporum*; original, from herbarium material on bark of *Liriodendron*. A, sporodochia on bark; B, section through sporodochium; C, conidiophore; D, conidia.

292. TUBERCULINA Sacc. Sporodochia small, breaking out in or near rust pustule; conidiophores hyaline, simple, non-septate, bearing single conidia terminally; conidia hyaline, 1-celled, globose or ovoid, to irregular; parasitic on rusts.

Fig. 292. *T. persicina*; original, from herbarium material on *Euphorbia marginata*. A, section of leaf showing two sporodochia of *Tuberculina* and an aecium of rust; B, conidiophores and conidia; C, conidia; D, aeciospore of rust. Reference (124).

293. SPHACELIA Lev. Sporodochium stroma-like, spreading; conidiophores hyaline, simple, septate, bearing conidia terminally; arranged in a compact palisade; conidia hyaline, small ovoid, 1-celled, produced in a sugary "honey dew"; parasitic in ovary of grain; imperfect stage of *Claviceps*.

Fig. 293. *S. segetum* (*Claviceps purpurea*); original, from prepared slide of section through young sclerotium; B, a portion of A, enlarged; C, palisade of conidiophores and conidia.

294. VOLUTINA Penz. and Sacc. Sporodochia sparse or gregarious, obconical to hemispherical, pale, with setae; setae hyaline, septate, pointed; conidiophores slender, cylindrical, compacted, hyaline; conidia 1-celled, hyaline, short-cylindrical, compacted, hyaline; conidia 1-celled, hyaline, short-cylindrical, catenulate; saprophytic.

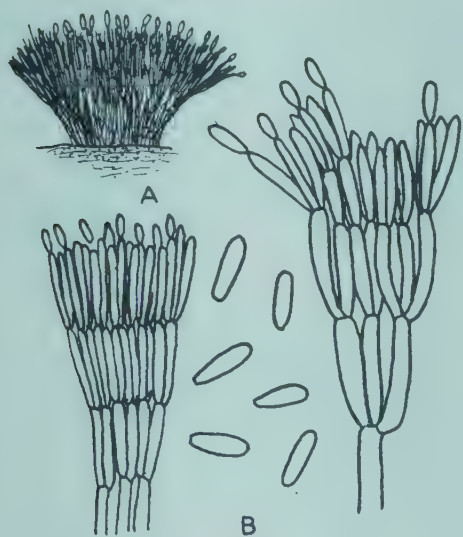
Fig. 294. *V. concentrica*; redrawn from Subramanian (254). A, sporodochium; B, conidiophores and conidia; C, apex of seta.

295. SCHIZOTRICHELLA Morris. Sporodochia subglobose, with narrow base, superficial, dark; setae simple, septate, pointed, dark; conidiophores crowded, branched; conidia 1-celled, hyaline, curved; saprophytic.

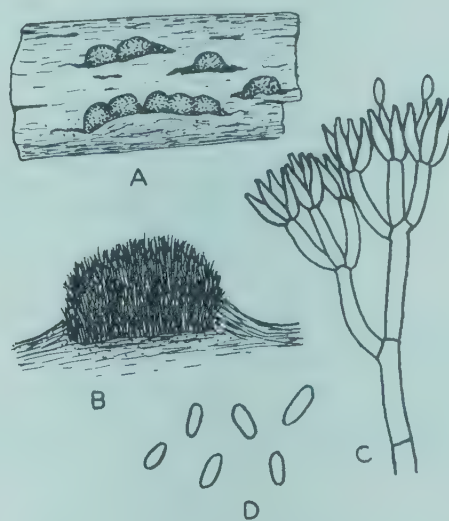
Fig. 295. *S. lunata*; redrawn from Morris (202). A, sporodochium; B, conidia; C, seta.

296. NEOTTIOSPORELLA Hohn. Sporodochia white, pyriform to subglobose, superficial, base surrounded by sterile hairs; conidia in gelatinous mass, 1-celled, hyaline, curved, tipped at each end with a slender appendage; saprophytic.

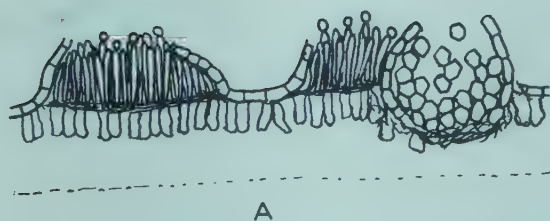
Fig. 296. *N. radiata*; redrawn from Morris (202). A, sporodochium; B, conidia; C, setae.



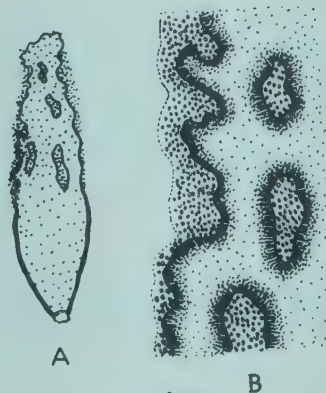
290. *Myrothecium*



291. *Dendrodochium*



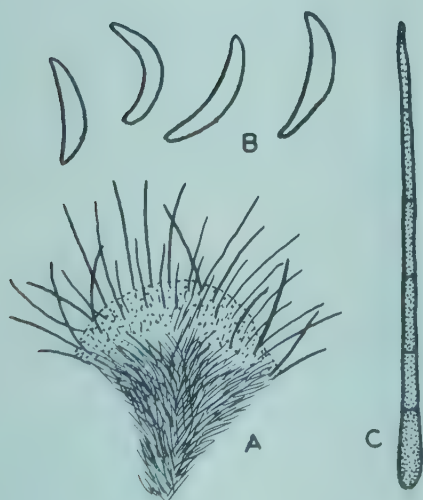
292. *Tuberculina*



293. *Sphacelia*



294. *Volutina*



295. *Schizotrichella*



296. *Neottiosporella*

297. **STARKEYOMYCES** Agnihot. Sporodochia bright-colored, superficial, without setae; conidiophores irregularly branched, in a more or less compact layer; conidia 1-celled, hyaline, apical, not catenulate, with an apical, membranous appendage.

Fig. 297. *S. koorchalomoides*; redrawn from Agnihotrudu (1). A, section through sporodochium; B, conidiophores; C, conidia with membranous appendages.

298. **LOMACHASHAKA** Subram. Sporodochia superficial, cup-like, with numerous, simple, septate, hyaline setae; conidiophores simple, hyaline, cylindrical, septate, terminating in phialides; conidia 1-celled, hyaline, apical, single, each with a single, apical, obconical, evanescent, mucoid appendage.

Fig. 298. *L. kera*; redrawn from Subramanian (258). A, sporodochium; B, conidiophores; C, conidia with appendages.

299. **KOORCHALOMELLA** Chona. Sporodochia scattered, circular to ovoid, superficial, bright-colored; conidiophores arising from loosely interwoven hyphae, simple, hyaline, cylindrical, closely compacted; conidia apical, 1-celled, hyaline, fusiform, pointed at each end with a membranous, funnel-shaped or brush-like appendage; saprophytic.

Fig. 299. *K. oryzae*; redrawn from Chona *et al.* (49). A, section through sporodochium; B, conidia with appendages.

300. **SETODOCHIUM** Bat. and Cif. Sporodochia superficial, gregarious, hemispheric, brownish, with setae; setae erect, dark, pointed; conidiophores radiate, densely crowded, straight or curved, simple or branched, breaking up into cylindrical, 1-celled, hyaline conidia at maturity; on leaves.

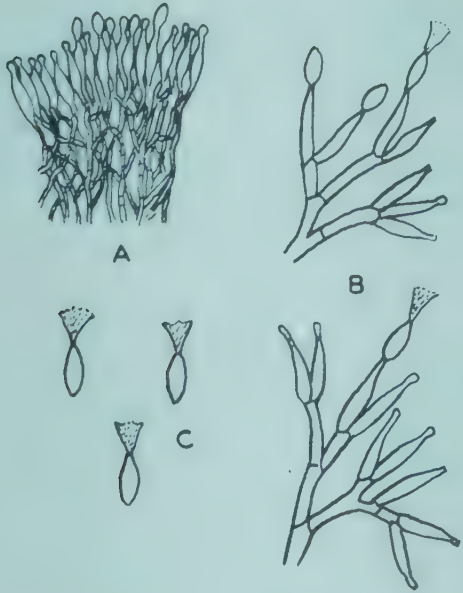
Fig. 300. *S. cascariae*; redrawn from Batista and Ciferri (16). A, sporodochium; B, conidiophore and conidia.

301. **VOLUTELLA** Tode. Sporodochia discoid, with marginal dark setae; conidiophores usually simple, in a compact palisade; conidia hyaline, 1-celled, ovoid to oblong; parasitic or saprophytic.

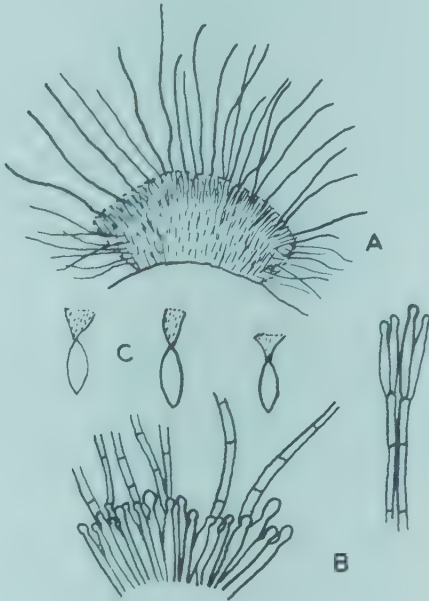
Fig. 301. *V. fructi*, original from herbarium material on apple fruit. A, erumpent sporodochia on apple fruit; B, conidiophores, conidia and setae.

302. **THOZETELLOPSIS** Agnihot. Sporodochia cushion-shaped, superficial, typically sessile, glistening, moist, situated on a small stroma; conidiophores branched, septate, hyaline, closely packed, intermixed with some awl-shaped, setae; conidia 1-celled, hyaline, apical, fusoid-curved to falcate, with a slender appendage at each end; saprophytic.

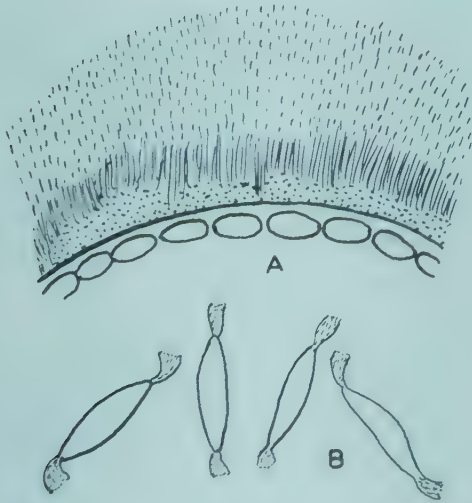
Fig. 302. *T. tocklaiensis*; redrawn from Agnihotrudu (2). A, conidiophore; B, seta; C, conidia.



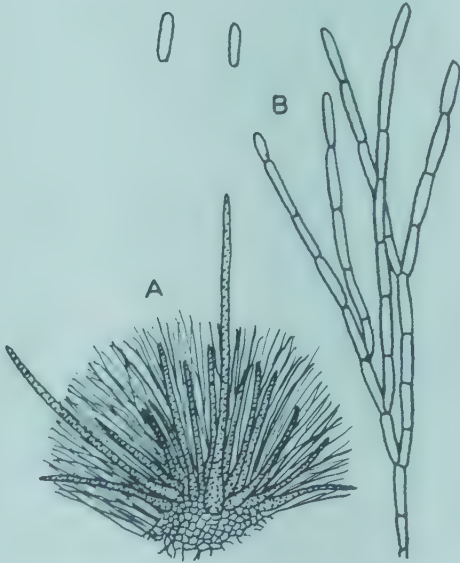
297. *Starkeyomyces*



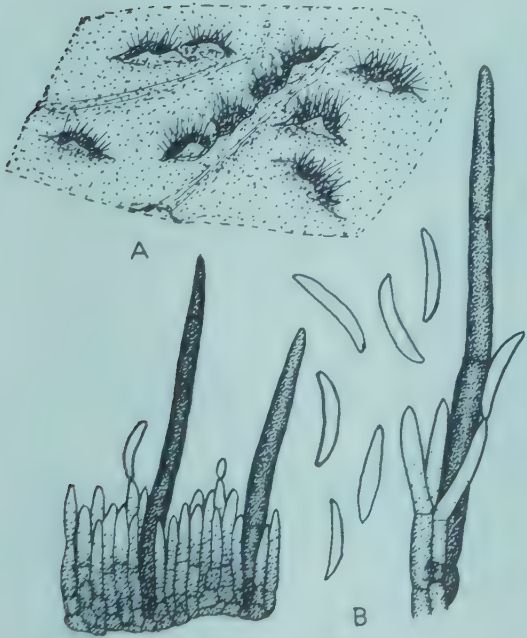
298. *Lomachashaka*



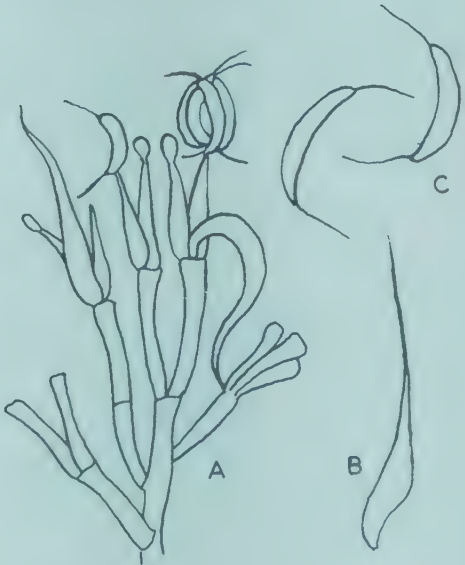
299. *Koorchalomella*



300. *Setodochium*



301. *Volutella*



302. *Thozetellopsis*

303. *SPHAEROSPORIUM* Schw. Sporodochia yellowish when fresh, cushion-shaped to hemispherical; conidiophores short, compact, hyaline, bearing apical chains of conidia; conidia 1-celled, globose to ovoid, large, with prominent scars of attachment, hyaline or yellowish; saprophytic on decayed wood.

Fig. 303. *S. lignatile*; original, from fresh material on decayed wood. A, B, sporodochia on wood; C, conidiophores; D, conidia. Reference (65).

304. *KUTILAKESOPSIS* Agnihot. and Barua. Sporodochia at first immersed in substrate becoming erumpent, pale olive-green, cushion-shaped; setae brown, wavy, blunt; conidiophores irregularly branched, hyaline, with long, slender phialides; conidia 2-celled, hyaline, produced successively; saprophytic, on plant material.

Fig. 304. *K. macalpineae*; redrawn from Agnihothrudu and Barua (3). A, sporodochium; B, portion of sporodochium with setae; C, conidiophore; D, conidia.

305. *WIESNERIOMYCES* Koorders. Sporodochia dark, cup-like, mostly with a short stipe, with setae; setae simple, septate, brown, pointed; conidiophores arising from a stromatic base, simple, short, erect, hyaline to subhyaline, long, slender, several-celled, fragmenting at maturity into 1- to few-celled pieces; saprophytic.

Fig. 305. *W. javanicus*; redrawn from Subramanian (258). A, habit of sporodochia; B, sporodochium; C, conidia.

306. *RAMULISPORA* Miura. Sporodochia small, arising from substomatal stromata and pushing through stomata; conidiophores hyaline, simple or branched, short; conidia hyaline, filiform, septate, with lateral branches, produced in gelatinous material; superficial sclerotia present; parasitic on leaves.

Fig. 306. *R. sorghi*; redrawn from Olive *et al.* (206).

307. *MICROSTROMA* Niessl. Sporodochia small, white, bursting out through the epidermis of leaves; conidiophores hyaline, 1-celled, somewhat clavate, bearing conidia terminally on short, fine, sterigmata (resembling a basidium and basidiospores); conidia hyaline, 1-celled, small, oblong; parasitic on leaves. Sometimes placed in Melanconiales.

Fig. 307. *M. juglandis*; redrawn from Wolf and Wolf (299).

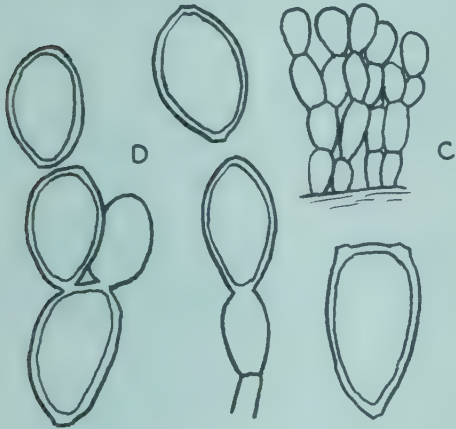
308. *AEGERITA* Pers. Stroma covering scale insects; sporodochia somewhat spherical, somewhat colored, superficial; conidia spherical, 1-celled; on scale insects.

Fig. 308. *A. webberi*; original, from herbarium material on citrus leaf. A, stroma covering scale insect on citrus leaf; B, section through stroma; C, two sporodochia showing sterile hyphae and conidium-like cells. Reference (96).



A

B



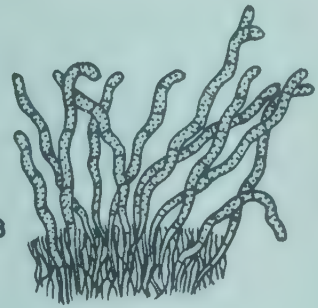
D

C

303. *Sphaerosporium*



A



B



C

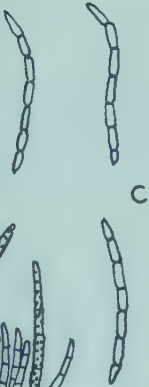


D

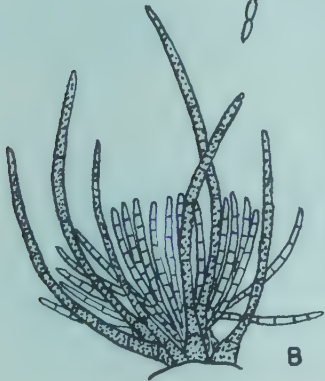
304. *Kutilakesopsis*



A

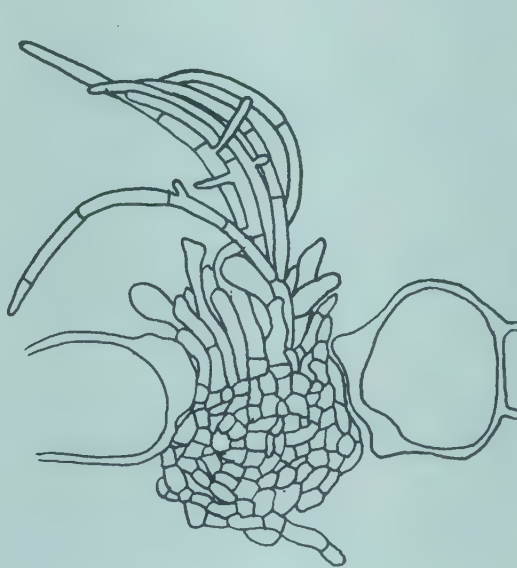


C

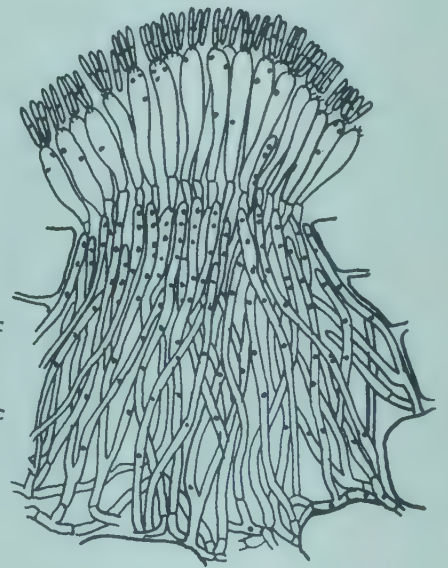


B

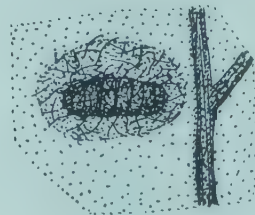
305. *Wiesneriomyces*



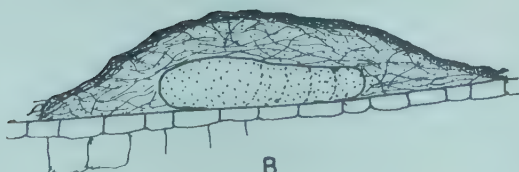
306. *Ramulispora*



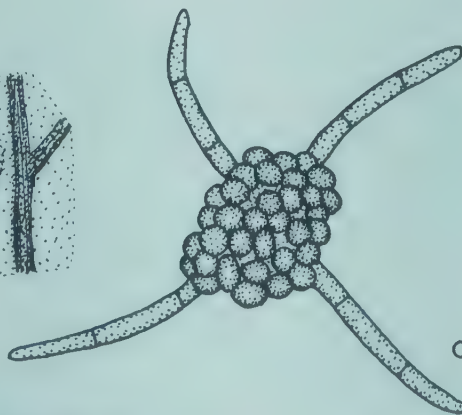
307. *Microstroma*



A



B



C

308. *Aegerita*

309. *BACTRIDIDIUM* Kunze. Sporodochia cushion-shaped to hemispherical, bright-colored (yellow); conidiophores long, simple or sparingly branched, hyaline; conidia apical, single, hyaline or containing yellow pigment, several-celled, very large, cylindrical to long-ellipsoid; saprophytic, on decayed wood.

Fig. 309. *B. flava*; original, from fresh material on wood. A, sporodochium; B, conidiophores; C, conidia.

310. *PUCCINIOPSIS* Speg. Sporodochia dark, cushion-shaped; conidiophores dark, simple, in a layer, bearing conidia apically on successive new growing tips; conidia dark, typically 2-celled, ovoid to oblong; parasitic.

Fig. 310. *P. caricae*; original from herbarium material on leaves of *Carica papaya*. A, sporodochia on leaf; B, section of sporodochia; C, conidiophores and conidia. Reference (182).

311. *HADROTRICHUM* Fr. Sporodochia cushion-shaped, dark; conidiophores dark, simple, forming a palisade and arising from a stroma-like layer; conidia dark, nearly spherical, 1-celled, borne singly; parasitic on leaves; the genus is often placed in the Dematiaceae.

Fig. 311. *H. blasdalei*; original, from herbarium material on leaves of *Vicia*. A, sporodochia on leaf; B, side view of sporodochium; C, conidiophores and conidia. Reference (148).

312. *STRUMELLA* Fr. Sporodochia cushion-like, dark; conidiophores dark, branched; conidia dark, 1-celled, ovoid or oblong, to irregular; parasitic or saprophytic on wood.

Fig. 312. *S. coryneoidea*; original, from herbarium material on oak. A, sporodochia; B, conidia. Reference (66).

313. *CEREBELLA* Ces. Sporodochia thin, flattened, olive-colored at first, later dark; conidiophores short, dark; conidia 1- to few-celled, brown, globose to pyriform or irregular, cells usually unequal in size; on heads of grasses, often called "false smut".

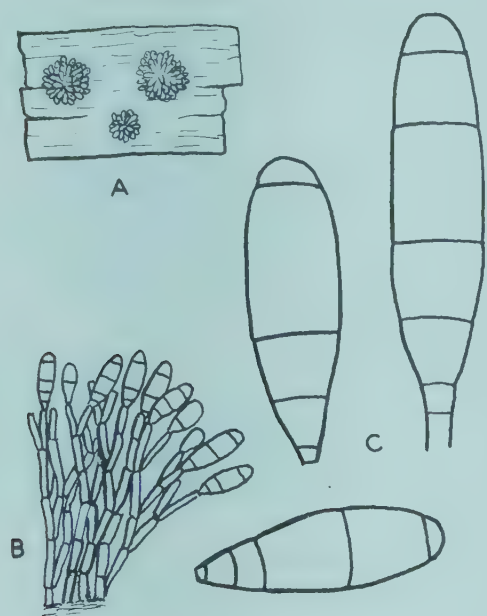
Fig. 313. *C. andripogonis*; original, from herbarium material on *Andropogonis sacchariodes*. A, habit on head of grass; B, conidiophores; C, conidia. Reference (244).

314. *CAMPTOMERIS* Syd. Sporodochia irregular, dark; poorly developed or lacking in some species; conidiophores dark, arising from special enlarged cells; conidia dark, 3- or more-celled, elongate; leaf parasites on Mimosaceae.

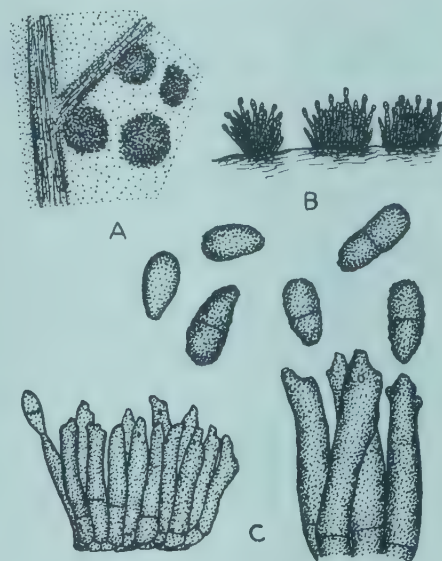
Fig. 314. *C. leucaenae*; A, sporodochium from above; B, vertical section through sporodochium; C, branch of sporodochium bearing three conidiophores; D, conidia; redrawn from Bessey (28). Other reference (142).

315. *EXCIPULARIA* Sacc. Sporodochia superficial, scattered, dark, with setae; setae simple, dark, septate, pointed; conidiophores short, simple, subhyaline; conidia several-celled, dark brown, fusiform, apical, single; saprophytic.

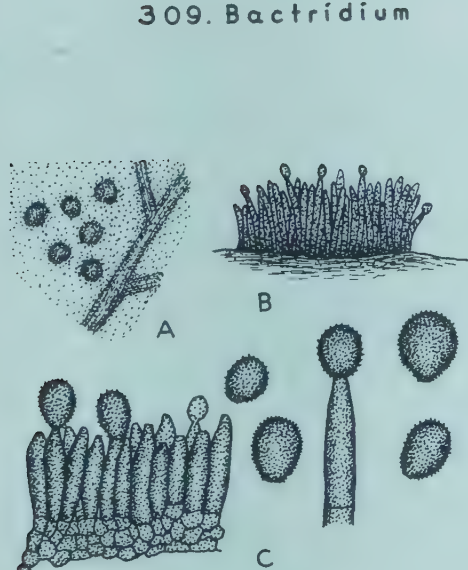
Fig. 315. *E. narsapurensis*; redrawn from Subramanian (258). A, sporodochium; B, conidia; C, seta.



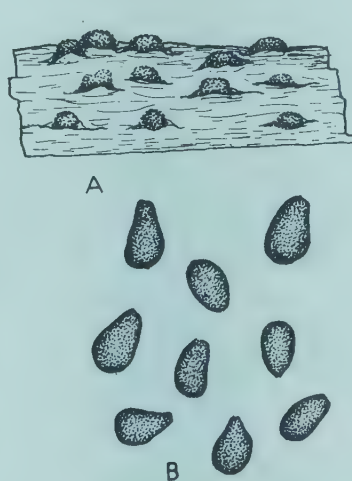
309. *Bactridium*



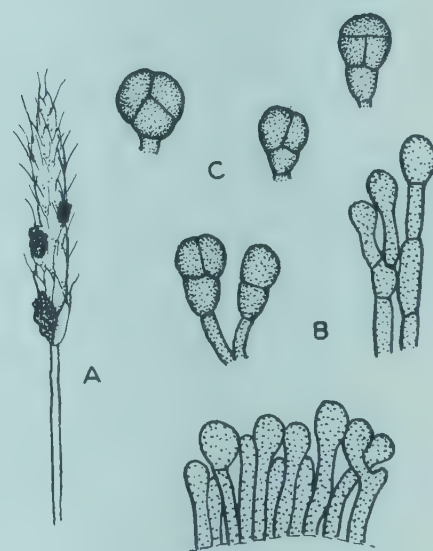
310. *Pucciniopsis*



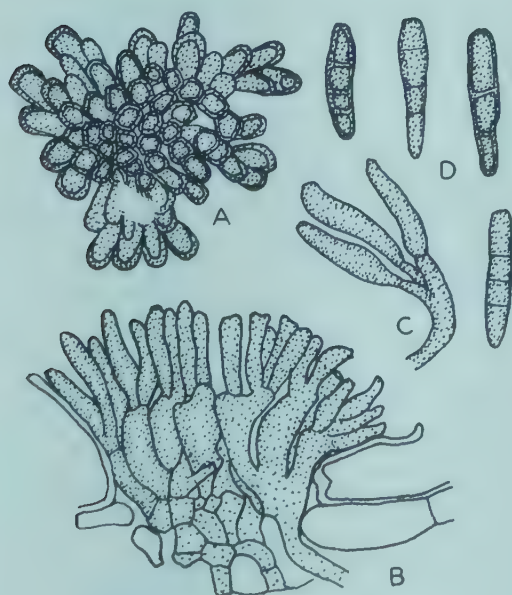
311. *Hadrotrichum*



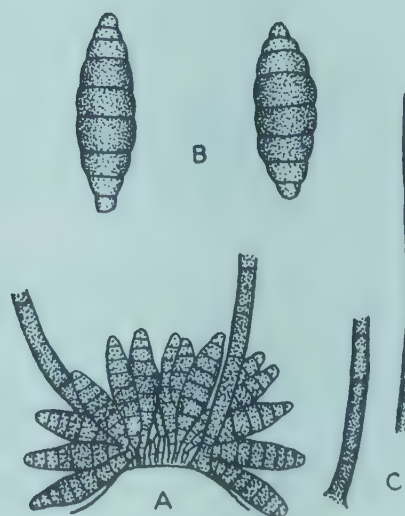
312. *Strumella*



313. *Cerebella*



314. *Camptomeris*



315. *Excipularia*

316. *EPICOCCUM* Link. Sporodochia dark, more or less cushion-shaped, variable in size; conidiophores compact or loose, dark, rather short; conidia dark 1-celled or several-celled, globose; mostly saprophytic.

Fig. 316. *Epicoccum* sp.; original from fresh material on decayed wood. A, sporodochia on decayed wood; B, C, conidiophores and conidia.

317. *SPEGAZZINIA* Sacc. Sporodochium small, dark; conidia of two kinds: (1) a 4-celled, spiny spore, borne apically on a long slender conidiophores; (2) a 4-celled smooth spore, borne on a short conidiophore; saprophytic on vegetable material; both conidiophore and conidia dark. The smooth spore and sporodochium are apparently lacking in some species.

Fig. 317. *S. ornata*; redrawn from Bessey (27). Other reference (64).

318. *CHEIROMYCES* Berk. and Curt. Sporodochium dark; cushion-like to hysteroid; conidiophores dark, short, simple or branched; conidia dark, branched into three or more upright arms, which do not all arise from the basal cell; saprophytic on wood. Compare with *Speira*.

Fig. 318. *C. stellatus*; A, hysteroid sporodochia; drawn from photograph by Damon (61); B, original from herbarium material on decayed wood.

319. *ISARIA* Pers. Synnemata light colored, cylindrical to clavate; conidia hyaline, 1-celled, ovoid, not produced in gelatinous material; saprophytic or parasitic on insects. Some species are imperfect stages of *Cordyceps*.

Fig. 319. *I. cretacea*; original, from culture. A, synnemata in culture turning toward source of light; B, portion of synnema; C, conidiophores and conidia.

320. *STILBUM* Tode. Synnemata erect, single or clustered, semi-rigid, hyaline or bright-colored, stipe cylindrical or tapering upward, capitate, bearing a head of conidia; conidiophores slender, branched; conidia 1-celled, hyaline, globose to ellipsoid, at first enveloped in mucus; saprophytic, on bark and wood.

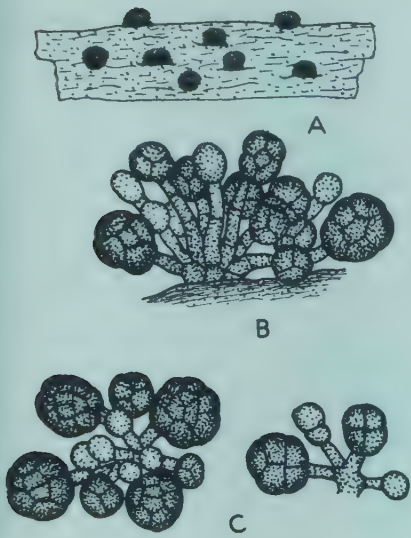
Fig. 320. *S. cinnabarinum*; original, from herbarium material on bark and wood. A, habit of synnemata on wood; B, synnema; C, portion of conidiophore; D, conidia.

321. *ACTINOCEPS* Berk. and Br. Synnemata hyaline to subhyaline, stalk cylindrical, with a single, terminal, subglobose head, with projecting hyaline setae; conidiophores septate, subhyaline; conidia 1-celled, subhyaline, ovoid; saprophytic.

Fig. 321. *A. cocos*; redrawn from Subramanian (254). A, synnemata; B, conidiophores; C, conidia.

322. *THAROOPAMA* Subram. Synnemata with well-defined stalk and head, hyphae becoming free to form conidiophores; conidiophores subhyaline to brown, septate, branched 1 to 3 times, with apical sporogenous cells; conidia borne on small teeth on upper portion of sporogenous cell, 1-celled, hyaline, globose.

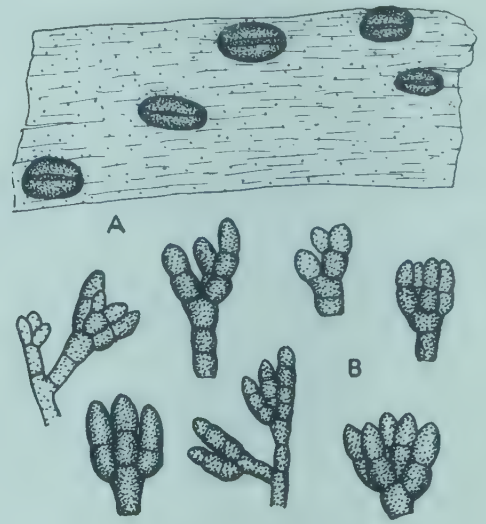
Fig. 322. *T. trina*; redrawn from Subramanian (258). A, synnema; B, conidiophores and conidia.



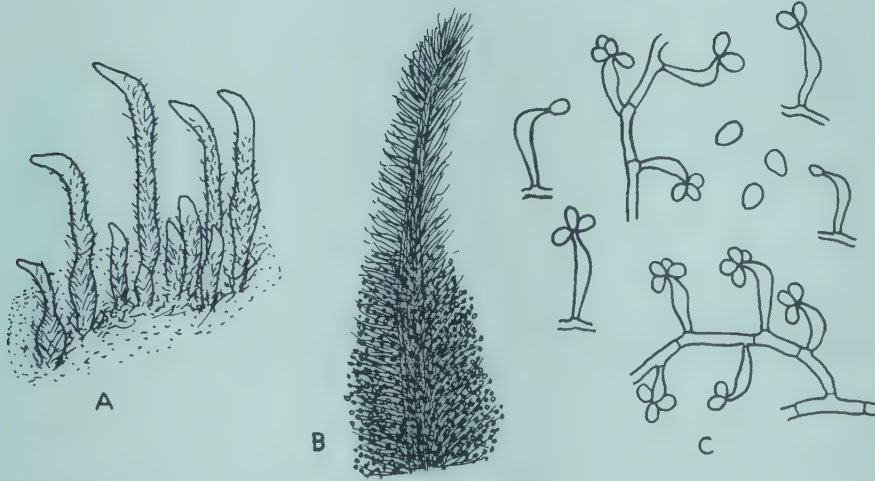
316. *Epicoccum*



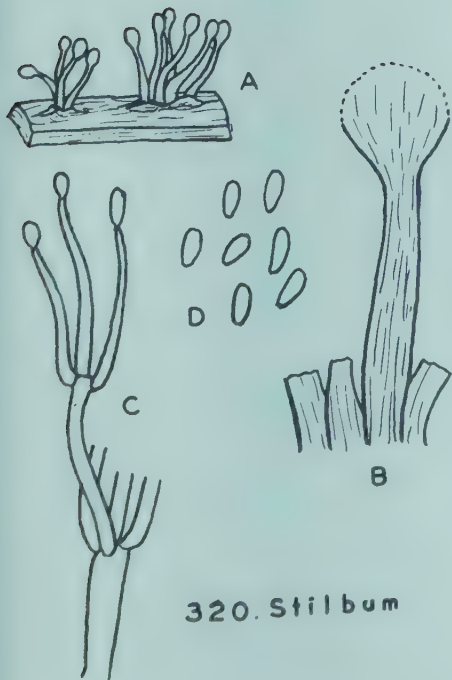
317. *Spegazzinia*



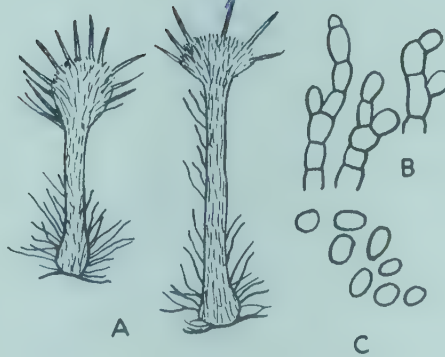
318. *Cheiromyces*



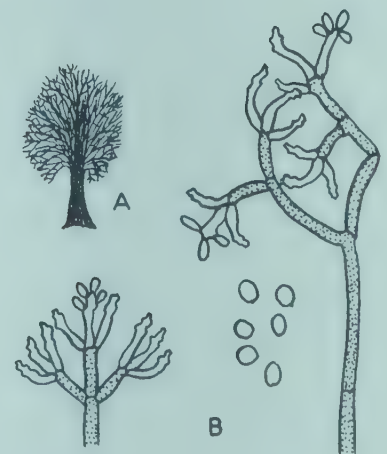
319. *Isaria*



320. *Stilbum*



321. *Actinoceph*



322. *Tharopama*

323. *GRAPHIUM* Corda. Synnemata tall, dark, bearing a rounded, terminal mass of conidia embedded in mucus; simple, hyaline conidiophores also produced in abundance, bearing oblong conidia which reproduce by budding; parasitic, often as vascular pathogens causing wilts of trees, or saprophytic. Some species are imperfect stages of *Ceratocystis*.

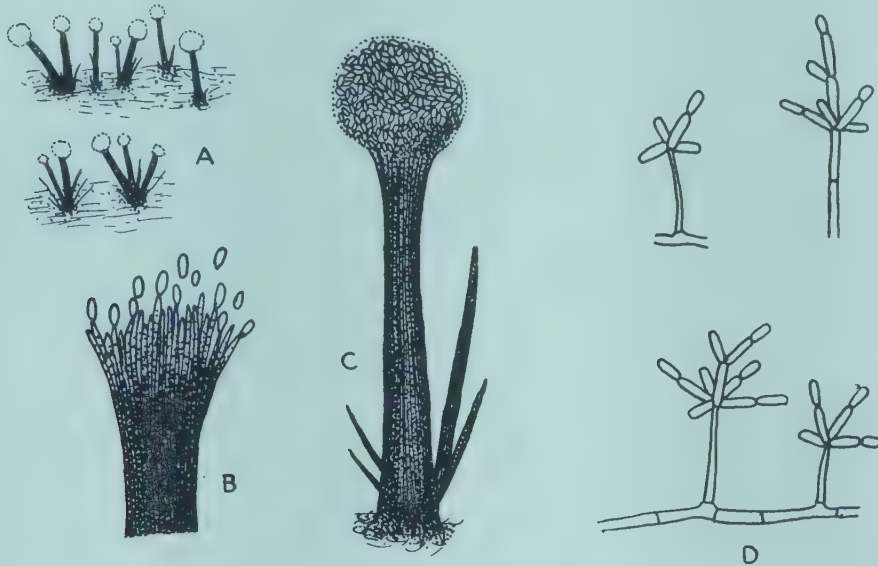
Fig. 323. *Graphium* sp.; original, from culture obtained from oak wood. A, habit of synnemata; B, synnema and conidial head enlarged; C, conidiophores and conidia from water mount; D, short hyaline conidiophores and conidia. Reference (117).

324. *STYSANUS* Cord. Synnemata dark, cylindrical to clavate, spore bearing portion elongate to nearly globose, loose; single conidiophores also produced in culture; conidia hyaline to dark, 1-celled, catenulate; weakly parasitic or saprophytic.

Fig. 324. *S. stemonitis*; original, from culture isolated from rotted potato. A, synnema; B, single conidiophores; C, conidia.

325. *SPOROCYBE* Fr. Synnemata dark, cylindrical, spore bearing head ovoid to subglobose; conidia dark, 1-celled, not in chains, collecting in dry masses; parasitic.

Fig. 325. *S. azaleae*; original, from dried material. A, synnemata on blasted *Rhododendron* flower; B, two synnemata as seen under low magnification; C, synnema showing sporulating head; D, conidia.



323. *Graphium*



324. *Stysanus*

325. *Sporocybe*

326. *HETEROCEPHALUM* Thaxt. Synnemata with long, cylindrical stalk composed of a central large strand surrounded by cortical hyphae, spore bearing portion more or less spherical with loose interwoven sterile hyphae and long slender spine-like hyphae surrounding the spore mass; branches of spore-bearing head thick, terminating in phialides; conidia hyaline, small, ovoid; saprophytic on dung or soil.

Fig. 326. *H. aurantiacum*; A, young synnema with enlarged fertile tip and overgrowing cortical hyphae; B, upper portion of mature synnema with sterile hyphae and central mass of conidia; C, portion of mature fruiting head showing phialides and conidia; redrawn from Thaxter (280). Other reference (217).

327. *MARTINDALIA* Sacc. and Ellis. Synnema stalk cylindrical, enlarged at apex to form a single head; conidiophores (at least some) and sterile hairs on stalk spirally coiled; conidia 1-celled, hyaline, apical, not in mucus; saprophytic.

Fig. 327. *M. spironema*; original, from herbarium material on decayed wood. A, B, synnemata; C, conidia.

328. *ANTHROMYCOPSIS* Pat. and Trab. Synnema stipe simple, hyaline, cylindrical; head dark, somewhat hemispherical, compact; conidiophores septate, compact; conidia 1-celled, brown, apical, catenulate, mostly ovoid; saprophytic.

Fig. 328. *A. broussonetiae* var. *minor*; redrawn from Subramanian (254). A, synnema; B, conidiophores, C, conidia.

329. *PAATHRAMAYA* Subram. Synnemata erect, simple, brown, with cylindrical stalk and hemispherical or globose head of closely packed conidiophores; conidiophores simple, subhyaline to pale brown, septate, bearing spores on upper portion apically and laterally on cup-like protuberances; conidia 1-celled, brown, not catenulate.

Fig. 329. *P. sundara*; redrawn from Subramanian (258). A, synnemata; B, conidiophores; C, conidia.

330. *ENDOCALYX* Berk. and Br. Synnemata erect, simple, expanding upward into a funnel which is filled with conidia; conidiophores are continuations of hyphae forming the core; conidia sessile or on short branches of conidiophore, 1-celled, brown, flattened, ovoid or irregular, with a germ slit; on twigs.

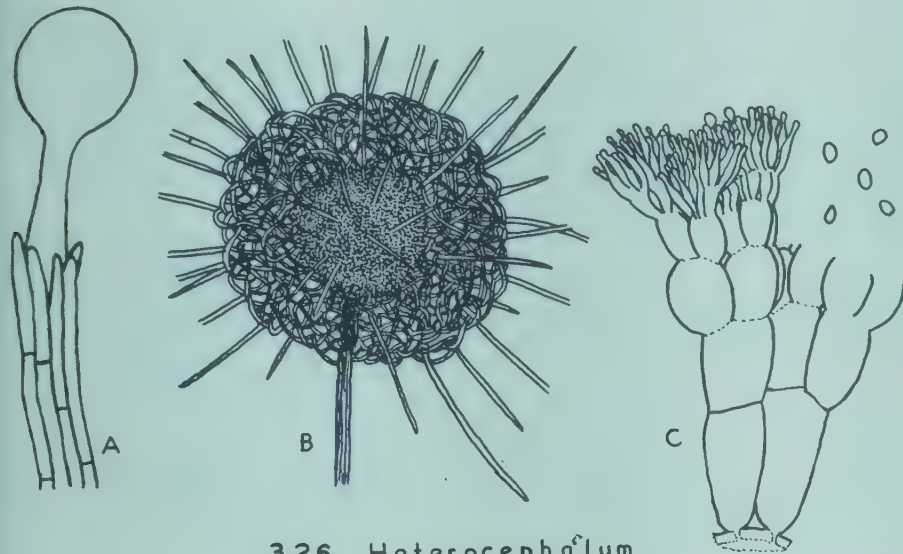
Fig. 330. *E. thwaitesii*; redrawn from Hughes (150). A, synnemata; B, conidia.

331. *ENDOSPOROSTILBE* Subram. Synnema simple, with a cylindrical stipe and hemispherical, fertile head; conidiophores (free ends of hyphae of stipe) diverging, brown; conidia 1-celled, hyaline, endogenous, in chains.

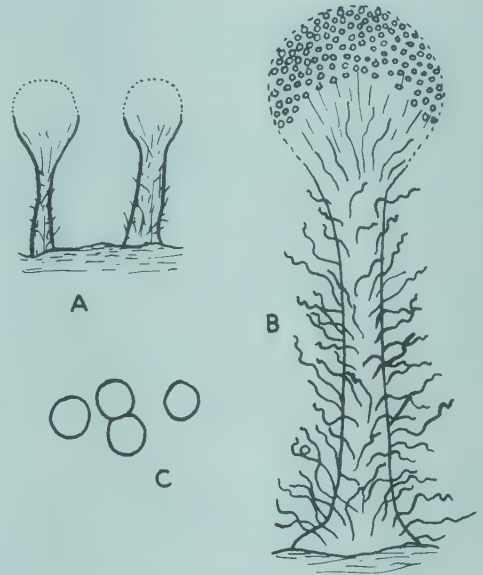
Fig. 331. *E. nilagirica*; redrawn from Subramanian (263). A, synnema; B, conidiophores; C, conidia.

332. *MENISPOROPSIS* Hughes. Synnema composed of two parts, a central emerging seta and an external shorter cortex compact at the base and loose at the fertile apex, the latter making up the conidiophores each with a single apical phialide, pale brown; conidia 1-celled, hyaline, curved, with a short filiform appendage at each end, produced in mucilage; saprophytic.

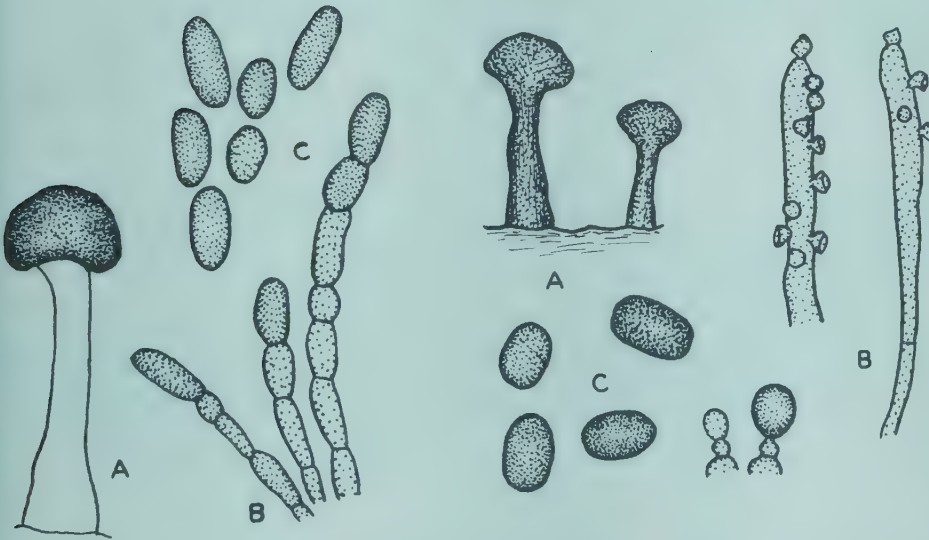
Fig. 332. *M. theobromae*; redrawn from Hughes (141).



326. *Heterocephalum*

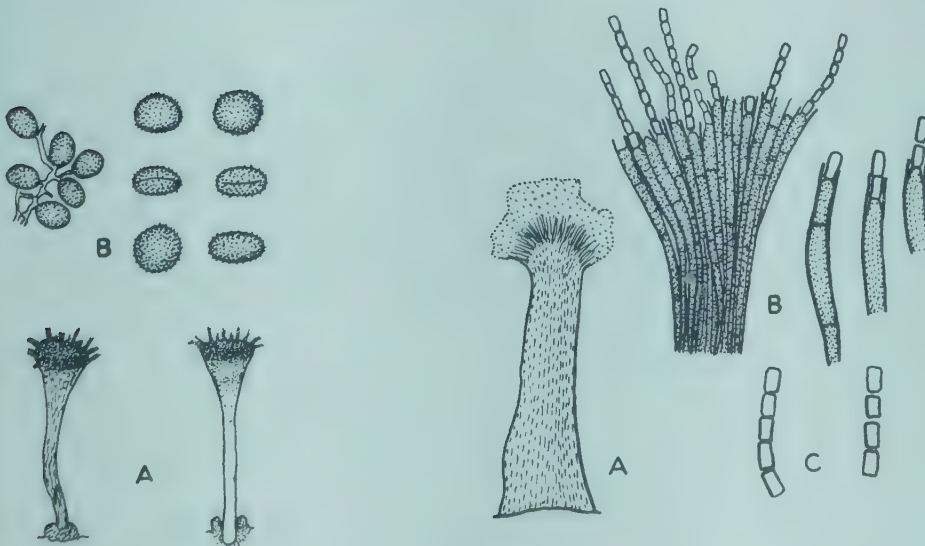


327. *Martindalia*



329. *Paathramaya*

328. *Anthromycopsis*



331. *Endosporostilbe*

330. *Endocalyx*



332. *Menisporopsis*

333. HARPOGRAPHIUM Sacc. Synnema dark brown, the upper spore-bearing portion capitate to elongate, fibrous, the hyphae with thick stubby tips; conidia hyaline, more or less falcate, 1-celled; saprophytic on bark and wood.

Fig. 333. *H. fasciculatum*; original, from herbarium material on bark. A, B, synnemata; C, redrawn from Subramanian (261).

334. DIDYMOBOTRYUM Sacc. Synnema with tall, cylindrical stipe and subglobose head, dark; conidiophores divergent, bearing conidia apically; conidia dark at maturity, 2-celled, oblong or cylindrical; saprophytic.

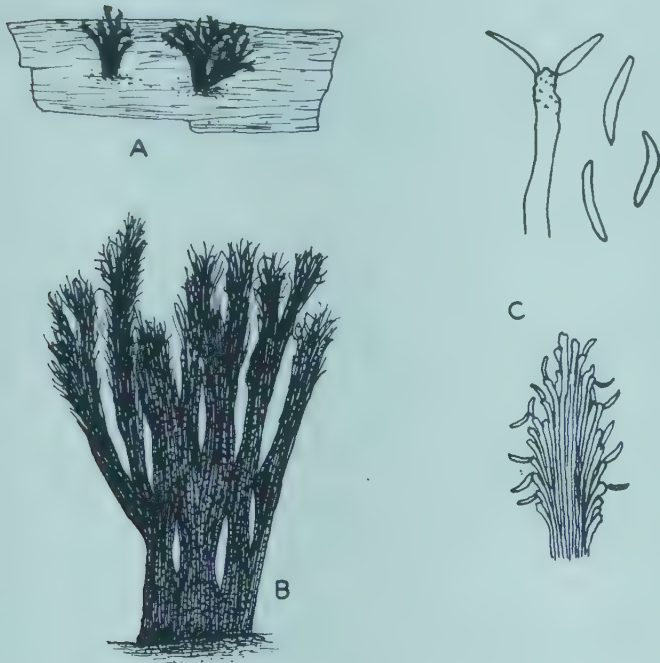
Fig. 334. *D. cookei*; original, from herbarium material on dead stems. A, habit of synnemata of wood; B, synnema; C, conidiophores and conidia.

335. ATRACTIUM Link. Synnema cylindrical, subhyaline, with long spore-bearing upper portion; conidiophores diverging, bearing conidia at apex; conidia mostly 4-celled, hyaline to subhyaline, long-fusoid to falcate; saprophytic.

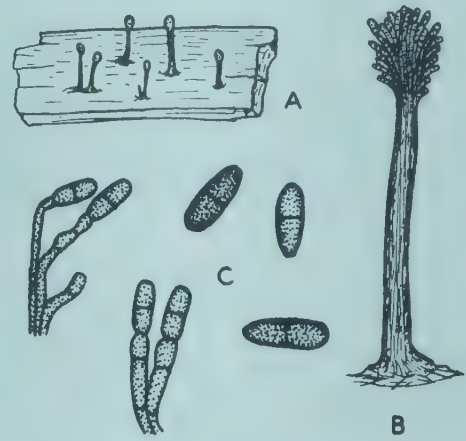
Fig. 335. *A. compositum* (*Arthrosporium compositum*); original, from herbarium material on dead bark. A, synnema; B, conidiophores; C, conidia.

336. DIDYMOSTILBE P. Henn. Synnemata light, stalk cylindrical, with an expanded, ovoid or rounded spore-bearing head; conidiophores hyaline, branched, short conidiophores produced abundantly in culture; conidia hyaline, 1-celled, usually becoming 2-celled, contained in droplets of slime; ovoid to elongate, saprophytic, principally on wood.

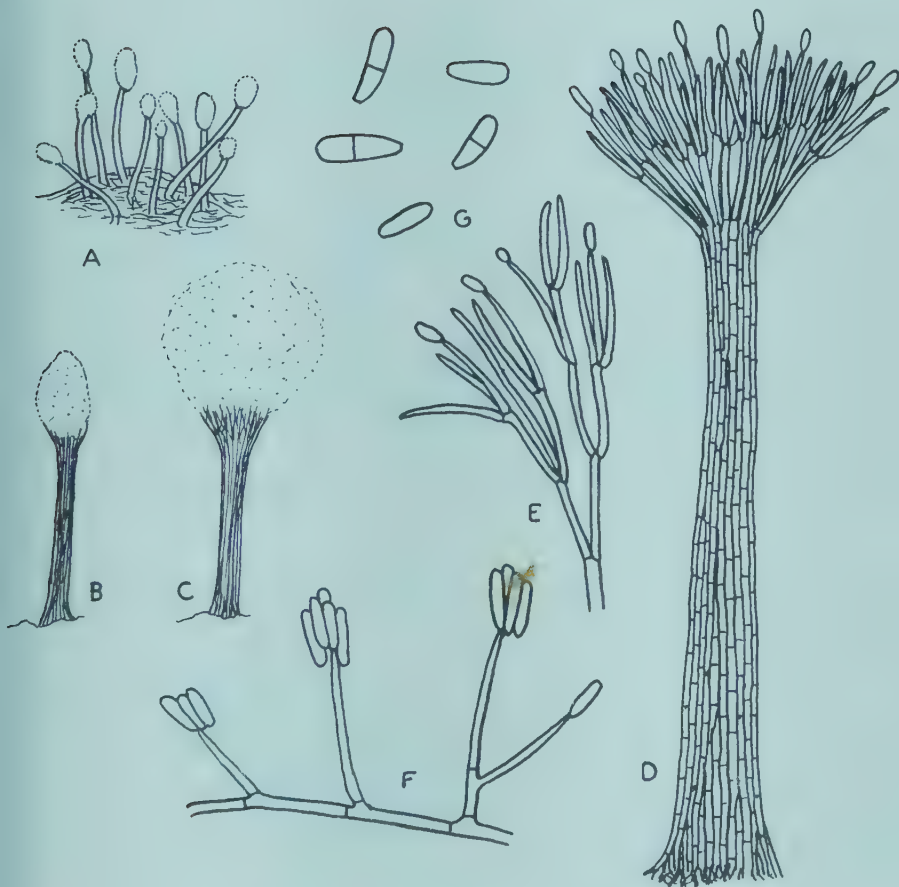
Fig. 336. *Didymostilbe* sp.; original, from culture isolated from a stump of *Liriodendron tulipifera*. A, synnemata showing heads of conidia embedded in slime; B, synnema dry; C, synnema moist; D, synnema showing conidiophores, from water mount; E, branched conidiophore from synnema; F, small conidiophores; G, conidia.



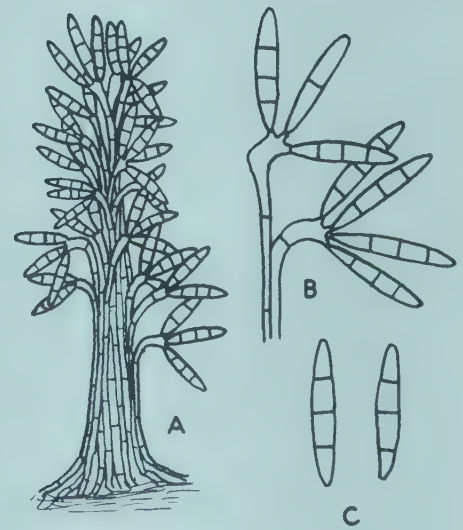
333. *Harpographium*.



334. *Didymobotryum*



336. *Didymostilbe*



335. *Atractium*

337. *PODOSPORIUM* Schw. Synnemata erect, clustered, black, cylindrical, with a long apical fertile portion; conidiophores septate, dark, diverging; conidia several-celled, dark, apical, single.

Fig. 337. *P. rigidum*; original, from herbarium material on stems of *Ampelopsis quinquefolia*. A, habit on stem; B, synnema; C, conidiophore and conidia.

338. *DENDROGRAPHIUM* Masee. Synnema with dark, cylindrical stipe, free ends of hyphae becoming conidiophores; conidiophores enlarged, radiating, simple or branched; conidia mostly 4-celled, dark, apical, in short acropetalous chains, cylindrical-ovoid; saprophytic.

Fig. 338. *D. interseminatum*; redrawn from Subramanian (259).

339. *ISARIOPSIS* Fres. Synnemata dark, composed of loose conidiophores, bearing conidia at or near the tips; conidia dark or pale, 2- or more-celled, cylindrical to obclavate, often curved; parasitic.

Fig. 339. *I. griseola*; original, from herbarium material on bark. A, C, synnemata; C, conidia.

340. *ARTHROBOTRYUM* Ces. Synnemata dark, cylindrical, with a globose sporulating head; conidia hyaline to dark, 3- to 4-celled, produced in slime; saprophytic on wood.

Fig. 340. *A. stilboideum*; A, synnemata; B, conidiophores; C, conidia. Redrawn from Subramanian (216). Other reference (138).

341. *PRATHODA* Subram. Synnemata erect, dark brown, simple or branched, with one or more apical clusters of conidiophores; conidiophores simple or branched, brown, septate, with prominent spore scars; conidia hyaline to subhyaline, long, slender, tapering upward, many-celled, produced apically on new growing points of conidiophore; saprophytic.

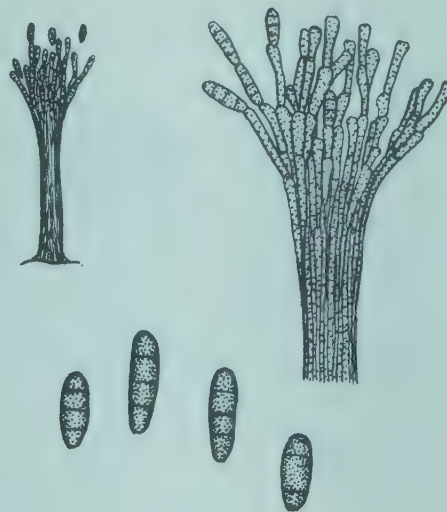
Fig. 341. *P. saparva*; redrawn from Subramanian (258). A, synnema; B, conidiophores and conidia.

342. *SCLEROGGRAPHIUM* Berk. Colonies covering surface of leaflets; synnemata tall, slender, black; conidiophores diverging outward, bearing near the apex small truncate pegs which bear single conidia; conidia several-celled with both transverse and longitudinal septa (dictyosporous), brown, dry.

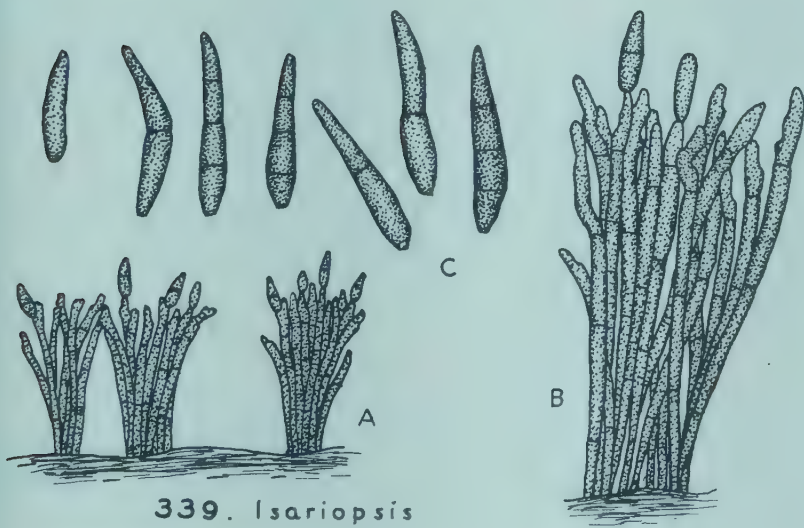
Fig. 342. *S. aterrimum*; redrawn from Hughes (140). A, synnema; B, conidiophores and conidia.



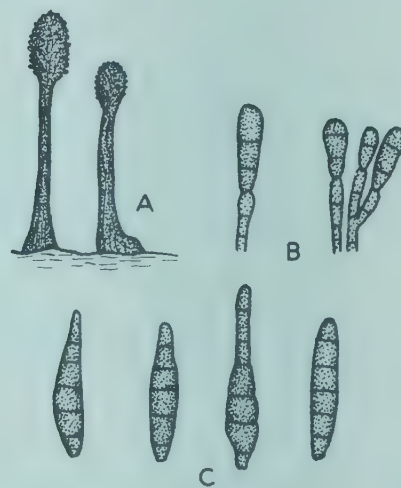
337. *Podosporium*



338. *Dendrographium*



339. *Isariopsis*



340. *Arthrobotryum*



341. *Prathoda*



342. *Sclerographium*

343. GIBELLULA Cav. Synnemata light to brown, cylindrical, composed of loose longitudinal hyphae; conidiophores brownish, terminal cell or cells hyaline, apex enlarged, bearing prophialides and phialides which compose a globose or broadly wedge-shaped head; conidia fusoid to ellipsoid, produced successively, single or in short chains; parasitic on spiders; conidial stages of *Torrubiella*.

Fig. 343. *G. suffulta*; A, synnemata on mummified spider; B, portion of synnema showing conidiophores and conidial heads; C, single conidiophore and conidial head; D, portion of conidial head; E, phialides; F, conidia; redrawn from Speare (238). Other reference (188).

344. HIRSUTELLA Pat. Synnemata, simple or with numerous branches arising nearly at right angles (some species lack synnemata); phialides arising laterally on synnema or from mycelium on host, hyaline, inflated below, abruptly or gradually narrowing to long slender sterigmata; conidia hyaline, 1-celled, oblong to cylindrical, covered with mucus; parasitic on insects.

Fig. 344. *H. saussurei*; A, B, portions of synnemata; C, phialides and conidia; redrawn from Speare (239). Other references (99, 190).

345. SYNNEMATIUM Speare. Synnemata simple or branched, brown when mature; phialides mostly at ends of branches, slender, tapering to a pointed tip; conidia hyaline to pale brown, covered with mucus, several spores held together in clusters; sclerotia spherical, becoming brown with thick-walled cells; parasitic on insects.

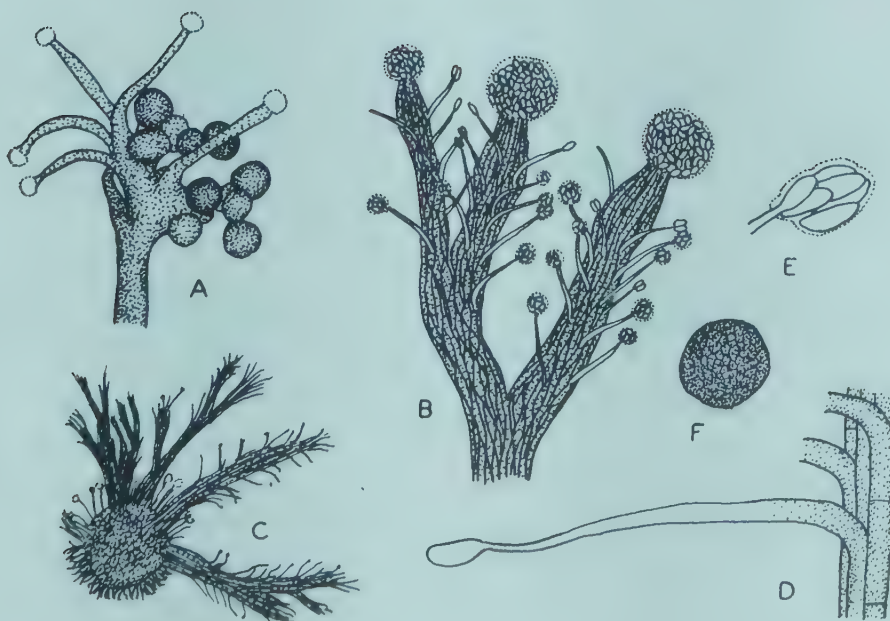
Fig. 345. *S. jonesii*; A, synnema producing sclerotia; B, synnema producing conidia; C, sclerotium germinating and producing synnemata; D, phialide and conidium; E, cluster of conidia in mucus; F, sclerotium; redrawn from Speare (238). Other reference (190).



343. *Gibellula*



344. *Hirsutella*



345. *Synnematum*

346. TRICHURUS Clem. and Shear. Synnemata dark, stalk slender, spore-bearing portion expanded; long black simple or branched hairs or spines present among the conidiophores; conidia dark, 1-celled, ovoid, catenulate; saprophytic.

Fig. 346. *T. terrophilus*; A, synnema; B, C, portions of synnema showing conidiophores, conidia and spines; redrawn from Swift and Povah (271).

347. HYMENOSTILBE Petch. Synnemata nearly cylindrical, composed of longitudinal, closely compacted hyphae; phialides in a layer covering the synnema, produced on short lateral branches, subcylindric to clavate, obtuse or narrowed on short sterigmata; conidia hyaline, 1-celled, smooth, borne singly; parasitic on insects or spiders.

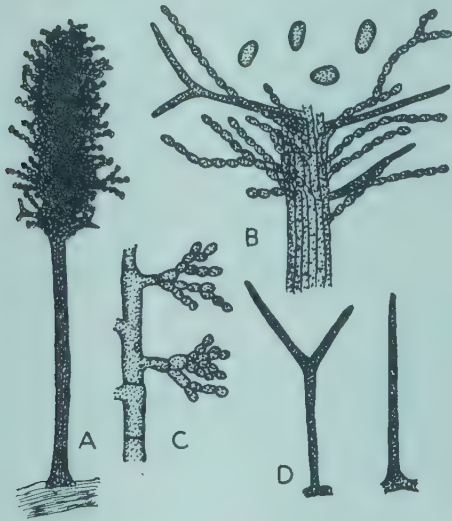
Fig. 347. *H. verrucosa*; A, synnemata of fungus on spider; B, conidiophore branch, phialides and conidia; A, drawn from photograph; B, redrawn from drawing; both from Mains (189).

348. INSECTICOLA Mains. Synnemata light colored, clavate, stipitate, upper spore-bearing portion compact composed of branching hyphae terminating in phialides which form a compact layer; conidia hyaline, 1-celled, smooth, catenulate; parasitic on insects.

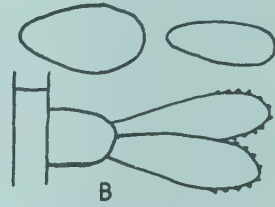
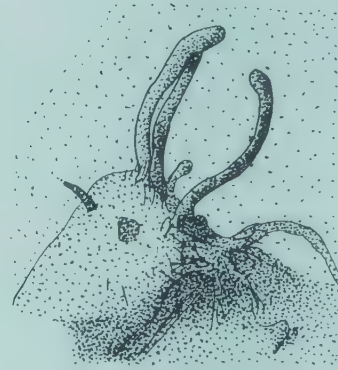
Fig. 348. *I. clavata*; A, synnemata on infected cricket; B, phialides and conidia; A, drawn from photograph; B, redrawn from drawing; both from Mains (189).

349. AKANTHOMYCES Leb. Synnemata light colored, cylindrical or somewhat attenuated above, composed of compact hyphae; phialides produced as terminal cells of lateral branches, in a compact layer, ellipsoid, obovoid or cylindrical, acute at the apex; conidia hyaline, 1-celled, smooth, catenulate; parasitic on insects and spiders.

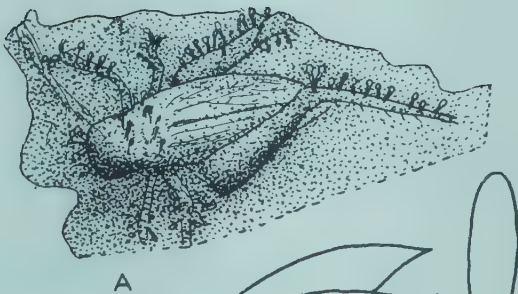
Fig. 349. *A. aculeata*; A, synnemata on dead moth; B, phialides and conidia; A, drawn from photograph; B, redrawn from drawing; both from Mains (189).



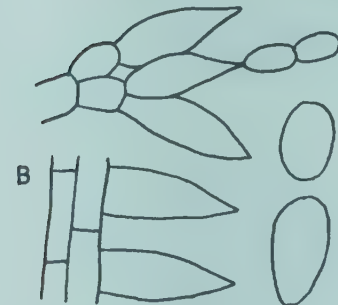
346. *Trichurus*



347. *Hymenostilbe*



348. *Insecticola*



349. *Akanthomyces*

SPHAEROPSIDALES

350. *PHYLLOSTICTA* Pers. Pycnidia dark, ostiolate, lenticular to globose, immersed in host tissue, erumpent or with a short beak piercing the epidermis; conidiophores short or obsolete; conidia small, 1-celled, hyaline, ovoid to elongate; parasitic, producing spots, principally on leaves. Compare with *Phoma*.

Fig. 350. *P. minima*; original, from dried material; A, leaf spot and pycnidia on leaf of maple; B, section of leaf and pycnidium; C, conidiophores; D, conidia.

351. *PHOMA* Desm. Pycnidia dark, ostiolate, lenticular to globose, immersed in host tissue, erumpent or with a short beak piercing the epidermis; conidiophores short or obsolete; conidia small, 1-celled, hyaline, ovoid to elongate; parasitic, principally on plant parts other than leaves, usually not in necrotic spots. *Phoma* is like *Phyllosticta*.

Fig. 351. A-C, *P. betae*, from culture; D, *P. lingam*, from section of host; original; A, side view of pycnidium; B, top view of pycnidium; C, conidia; D, pycnidium and conidia.

352. *PHIALOPHOROPHOMA* Linder. Pycnidia black, subcarbonaceous, subglobose to ellipsoid, with distinct ostiole, immersed in substrate; conidiophores hyaline, simple or branched, lining the cavity of the pycnidium; conidia endogenous, 1-celled, hyaline, ellipsoid; saprophytic on bark in sea water.

Fig. 352. *P. litoralis*; redrawn from Barghoorn (11). A, pycnidium; B, conidiophores; C, conidia.

353. *AOSPHAERIA* Sacc. Pycnidia dark, rounded, erumpent to superficial, clustered or single, with a short papillate ostiole; conidiophores short, 1-celled; conidia hyaline, 1-celled elongate to globose; saprophytic on wood.

Fig. 353. *P. pezizoides*; original, from herbarium material on *Fraxinus* wood. A, habit of pycnidia; B, section through pycnidia; C, conidiophores; D, conidia.

354. *PLENODOMUS* Preuss. Pycnidia dark, immersed, irregular in shape, opening irregularly at the apex; conidia hyaline, 1-celled, oblong; parasitic.

Fig. 354. *P. destruens*; original. A, surface view of erumpent pycnidia on sweet potato stem; B, section through pycnidia; C, pycnidia produced in culture; D, conidia.

355. *PYRENOCHAETA* deNot. Pycnidia dark, ostiolate, nearly globose, erumpent with a few simple bristles, especially near the ostiole; conidiophores simple or branched; conidia small, 1-celled, hyaline, ovoid to elongate; parasitic or saprophytic.

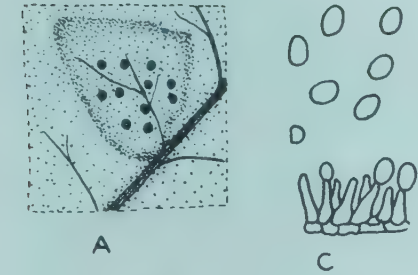
Fig. 355. *Pyrenochaeta* sp.; original, from culture isolated from oak wood. A, group of pycnidia; B, pycnidium; C, conidiophores and conidia.

356. *DENDROPHOMA* Sacc. Pycnidia dark or light brown, superficial or submerged and erumpent ostiolate, globose or elongated; conidiophores elongated, branched, conidia hyaline, 1-celled, elongate to ellipsoid; parasitic, causing leaf spots, or saprophytic.

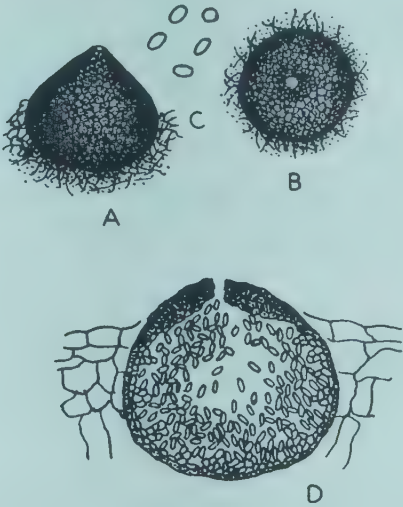
Fig. 356. *D. obscurans*; original, from culture. A, cluster of pycnidia; B, pycnidium and exuded mass of conidia; C, conidiophores; D, conidia.

357. *SELENOPHOMA* Maire. Pycnidia brown, globose, immersed, erumpent, ostiolate; conidia hyaline, 1-celled, bent or curved, typically lunate or less often bommerang-shaped; parasitic, causing spots on grasses and some other hosts.

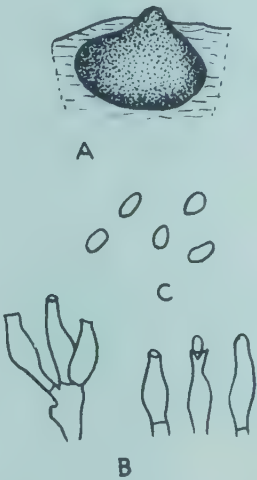
Fig. 357. *S. linicola*; A, B, pycnidia on flax stem, drawn from photographs; C, conidia; all redrawn from Vanterpool (289). Other reference (244).



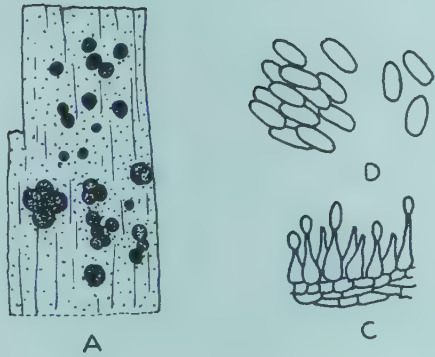
350. *Phyllosticta*



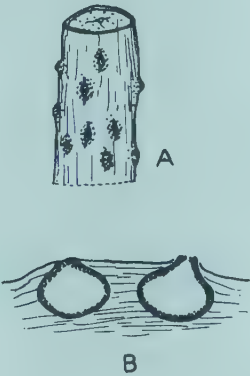
351. *Phoma*



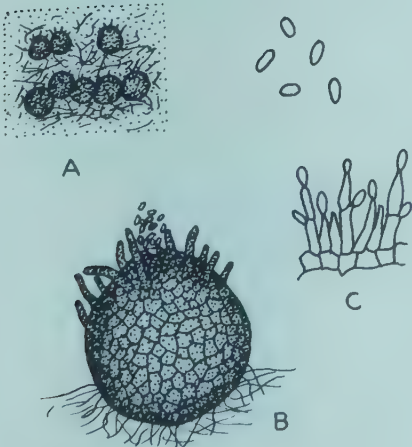
352. *Phialophorophoma*



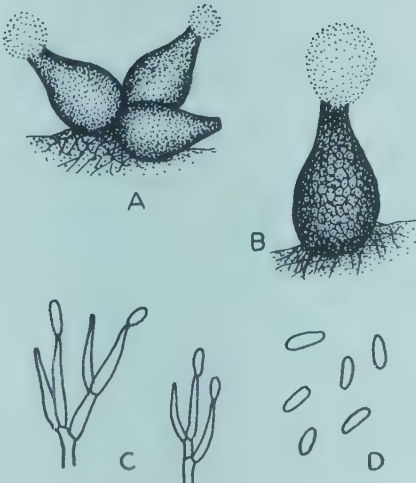
353. *Aposphaeria*



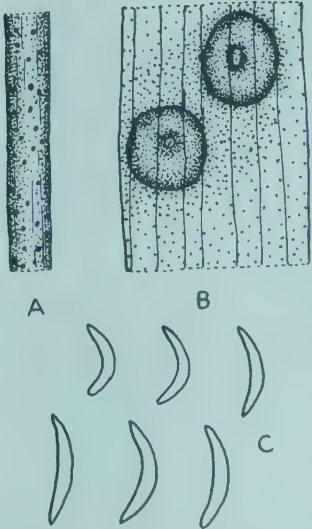
354. *Plenodomus*



355. *Pyrenochaeta*



356. *Dendrophoma*



357. *Selenophoma*

358. PEYRONELLAEA Goidanich. Pycnidia brown to black, superficial to partly immersed, rounded, with conspicuous ostiole, single to crowded; conidia 1-celled, hyaline or later becoming subhyaline to dark, ovoid to ellipsoid; chlamydospores many-celled, dark, apical or intercalary, with irregular septations; saprophytic or parasitic.

Fig. 358. *Peyronellaea* sp.; original, from culture. A, habit of pycnidia in culture; B, pycnidia; C, conidia; D, chlamydospores. References (111, 283).

359. RHIZOSPHAERA Mang. and Har. Pycnidia superficial, somewhat globose, dark, of cellular texture, with ostiole at apex, tapering below to a stalk; conidiophores short, simple; conidia 1-celled, hyaline, ovoid, smooth.

Fig. 359. *R. pini*; original, from herbarium material on leaves of *Abies balsamea*. A, B, C, habit of pycnidia on leaf; D, pycnidium; E, conidiophores and conidia.

360. PHOMOPSIS Sacc. Pycnidia dark, ostiolate, immersed, erumpent, nearly globose; conidiophores simple; conidia hyaline, 1-celled, of two types, ovoid to fusoid (alpha) conidia; and filiform, curved or bent stylospores (beta conidia); parasitic, causing spots on various plant parts. Imperfect stage of *Diaporthe*.

Fig. 360. *P. (Diaporthe) vexans*; original, from egg plant fruit. A, fruit spot showing pycnidia; B, pycnidia; C, alpha conidia; D, beta conidia; E, conidiophores.

361. ASTEROMELLA Pass. and Thum. Pycnidia dark, small, globose, ostiolate, located in a mass of radiating dark hyphae; conidia hyaline, 1-celled, ovoid to cylindrical; parasitic on leaves.

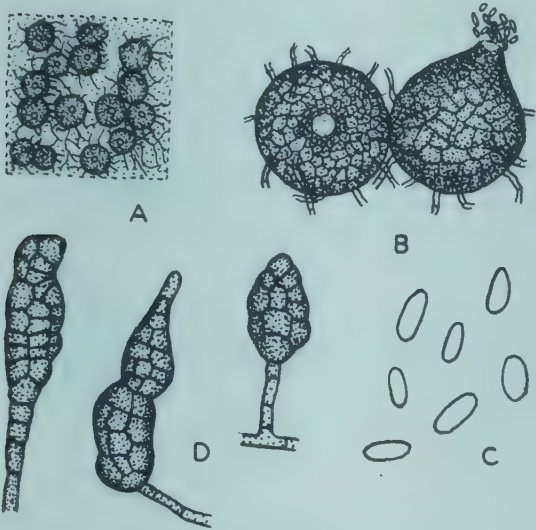
Fig. 361. *A. andrewsii*; original, from herbarium material on leaves of *Gentiana puberula*; A, leaf spots and habit of fungus; B, top view of perithecia and radiating hyphae; C, section of pycnidium; D, conidia.

362. CHAETOPHOMA Cooke. Pycnidia dark, small, globose to irregular, without ostiole, in dense or loose clusters, seated on an olive-colored subiculum; conidia hyaline, 1-celled, very small, ovoid; saprophytic on plant material.

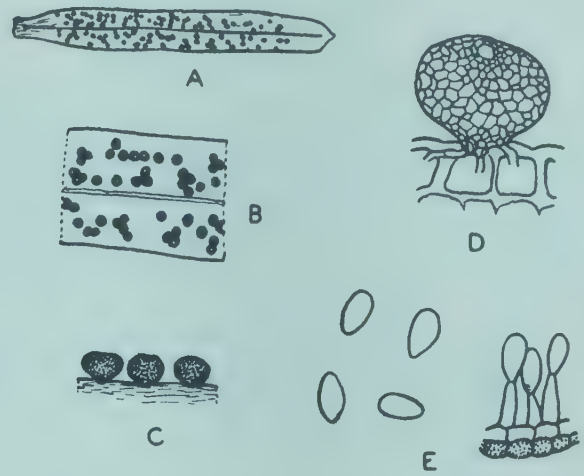
Fig. 362. *C. confluens*; original, from herbarium material on dead stems of *Spartina*. A, habit, showing clusters of pycnidia on stem; B, group of pycnidia, enlarged; C, conidia.

363. MACROPHOMA Berl. and Vogl. Pycnidia dark, ostiolate, globose, erumpent; conidiophores simple, short or elongate; conidia hyaline, 1-celled, over 15 microns long, ovoid to broadly ellipsoid; parasitic.

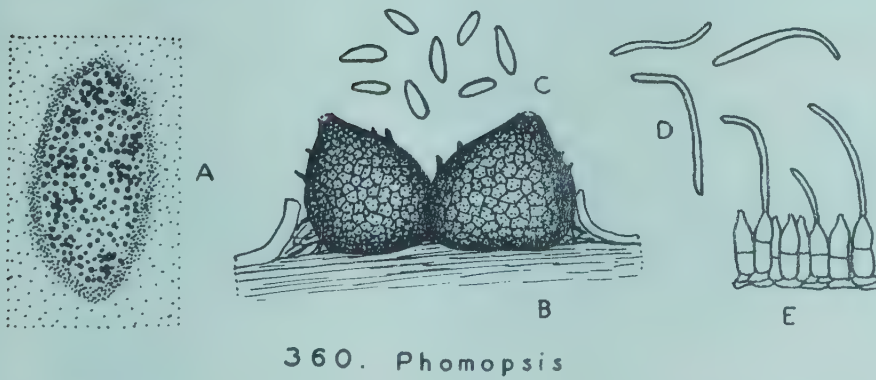
Fig. 363. *Macrophoma* sp.; original, from dried oak leaves. A, leaf spot and pycnidia; B, section through pycnidium; C, conidiophores and immature conidia; D, mature conidia.



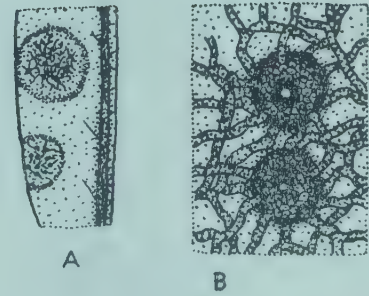
358. *Peyronellaea*



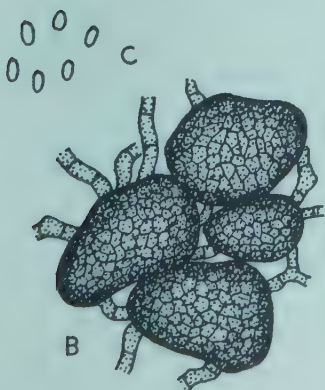
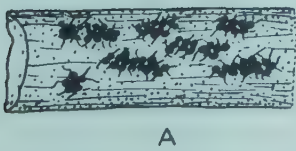
359. *Rhizosphaera*



360. *Phomopsis*



361. *Asteromella*



363. *Macrophoma*

362. *Chaetophoma*

364. ELEUTHEROMYCELLA Hohn. Pycnidia single, black, smooth, soft-leathery, with ostiole; conidiophores simple or branched, septate; conidia 1-celled, hyaline, cylindrical-ellipsoid, with a filiform pedicel and a slender, apical appendage; on other fungi.

Fig. 364. *E. mycophila*; redrawn from Seeler (230). A, pycnidium imbedded in host fungus; B, cells of pycnidial wall; C, conidiophores and conidia.

365. SPHAERONEMA Fr. Pycnidia dark, superficial or erumpent, base spherical, with a long beak; conidiophores simple; conidia hyaline, 1-celled, ovoid to elongate chiefly saprophytic.

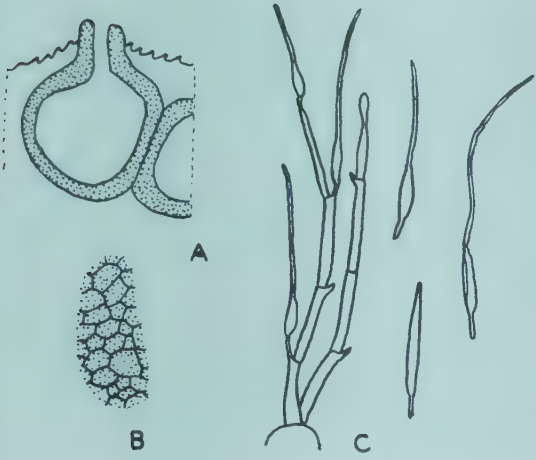
Fig. 365. *S. acerinum*; original, from herbarium material on dead branches of *Acer*. A, habit of perithecia; B, section showing single pycnidium enlarged; C, conidiophores, conidia and sterile hyphae; D, conidia.

366. HYALOPYCNIS Hohn. Pycnidia superficial, light-colored (shiny white), membranous, with a globose base and a long, subcylindrical neck, fimbriate at the apex; wall of pycnidium and neck composed of parallel hyphae fused laterally; conidiophores long, simple or branched; conidia 1-celled, hyaline, cylindrical or ovoid; on other fungi.

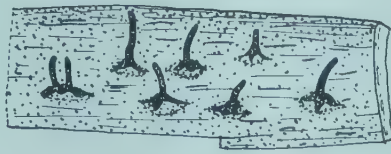
Fig. 366. *Hyalopycnis* sp.; original, from culture. A, habit of pycnidia in culture; B, pycnidium showing parallel hyphae; C, conidiophore; D, conidia from pycnidium; E, conidia borne directly on mycelium Reference (209).

367. ELEUTHEROMYCES Fuckel em. Seeler. Pycnidia single, superficial, light-colored, soft-leathery or gelatinous and translucent when wet, walls and neck composed of small irregular cells; conidiophores hyaline, lining neck as well as base of pycnidium, septate, bearing conidia apically and laterally; conidium 1-celled, hyaline, ellipsoid, attenuated at apex and at base; on basidiomycetes.

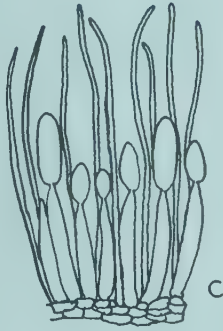
Fig. 367. *E. subulatus*; redrawn from Seeler (230). A, B, pycnidia; C, C, cells of pycnidial wall; D, conidiophores; E, conidia.



364. *Eleutheromycella*



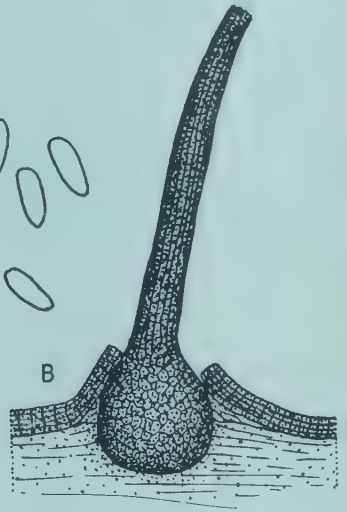
A



C

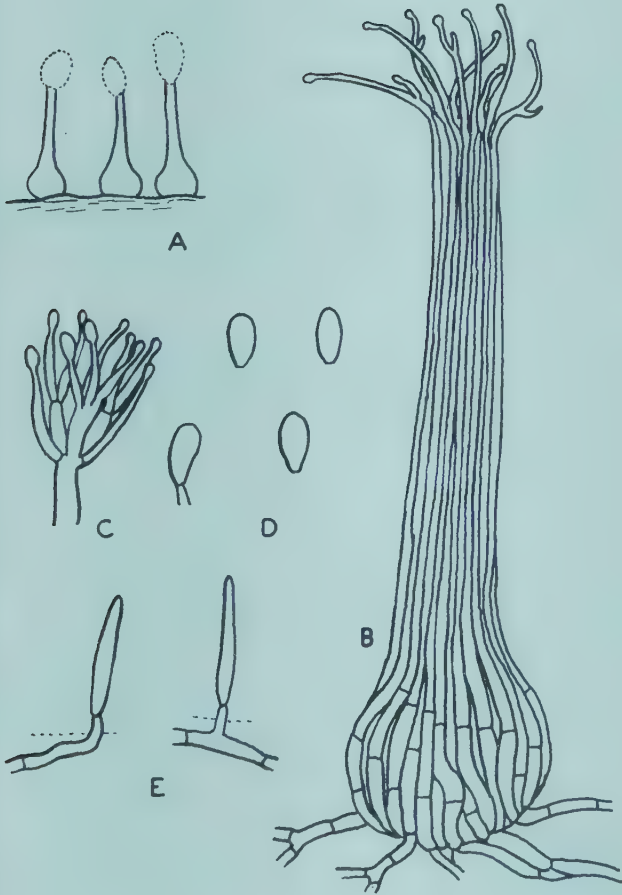


D



B

365. *Sphaeronema*



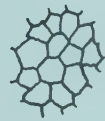
A

C

B

D

E



C



A



B



D



E

367. *Eleutheromyces*

366. *Hyalopycnis*

368. NEOTTIOSPORA Desm. Pycnidia separate, globose, membranous, dark, innate, ostiolate; conidiophores short, simple, hyaline; conidia 1-celled, hyaline, each with a single appendage; appendage mucoid, evanescent, in the form of an inverted, hollow cone with thin hyaline walls, formed by the rupture of the outer wall which later becomes everted and funnel-like; saprophytic.

Fig. 368. *N. caricina*; redrawn from Cunnell (57). A, section of pycnidium; B, conidiophores showing developing conidia; C, conidia with appendages. Other reference (269).

369. CYTOSPORINA Sacc. Stroma black, cushion-shaped or tubercular; pycnidia distinct, sunken, arranged more or less in a circle in the stroma, with ostiole; conidia 1-celled, hyaline, filiform, curved or bent; saprophytic on bark.

Fig. 369. *C. ludibunda*; original, from herbarium material on bark of *Prunus serrulata*. A, habit of pycnidia in bark; B, section through stroma and pycnidia; C, conidia.

370. SCLEROTIOPSIS Speg. Pycnidia large, separate, smooth, without a pore, fleshy or membranous; conidiophores erect, simple, filiform; conidia 1-celled, hyaline, ellipsoid, angular at both ends.

Fig. 370. *S. concava*; original, from herbarium material on *Galax aphylla* leaf. A, habit of pycnidia on leaf; B, section of pycnidium; C, conidiophores; D, conidia.

371. AMPELOYMCES Ces. (*Cicinnobolus* Ehrenb.) Pycnidia dark, rounded, clavate or fusoid, developing inside conidiophores of powdery mildew fungi (Erysiphaceae) without ostiole; conidia hyaline or subhyaline, 1-celled, ovoid to oblong; parasitic on Erysiphaceae.

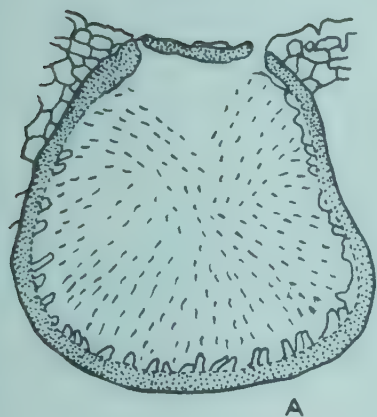
Fig. 371. *A. quisqualis*; original, from herbarium material on *Erysiphe* on leaf of *Grindelia*. A, hyphae and conidiophores of *Erysiphe*, some bearing pycnidia of the parasite; B, C, pycnidia enlarged; D, conidia. Reference (219).

372. DOTHIORELLA Sacc. Pycnidia dark, globose, grouped in a well-developed stroma; stroma subcortical, breaking out; conidiophores simple, short; conidia hyaline, 1-celled, ovoid to broadly ellipsoid; parasitic or saprophytic on wood.

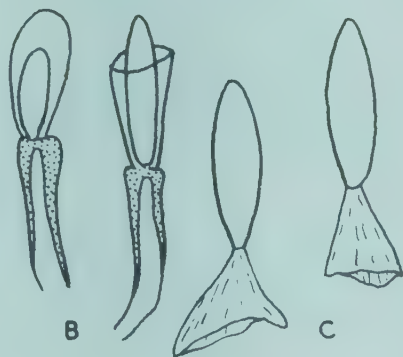
Fig. 372. *Dothiorella* sp.; original, from dried material on oak twigs. A, habit of pycnidia and stromata; B, section through stroma; C, conidiophores; D, conidia.

373. DILOPHOSPORA Desm. Pycnidia dark, globose, ostiolate, usually stromatic, withing plant tissue; conidia 1-celled, hyaline, cylindrical, with short, branched, slender appendages at both ends.

Fig. 373. *D. alepecuri*; original, from herbarium material on *Andropogon trachycaulum*. A, habit of pycnidia in leaf; B, pycnidia in stroma; C, conidia with appendages.

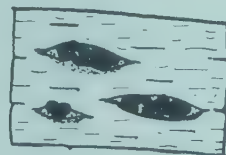


A

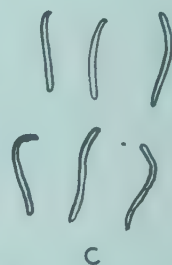


B

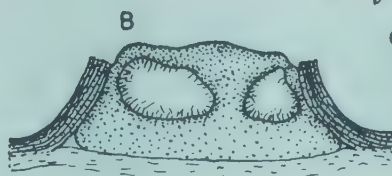
C

368. *Neottiospora*

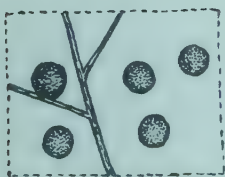
A



C



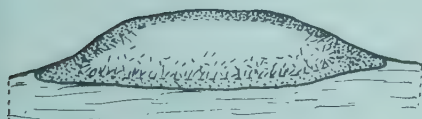
B

369. *Cytosporina*

A



D



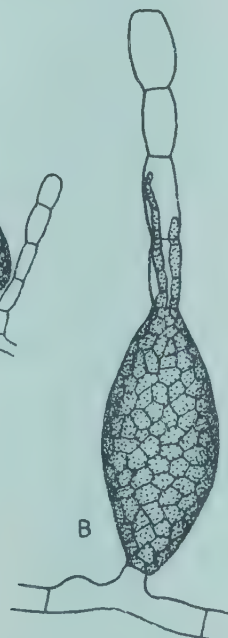
B



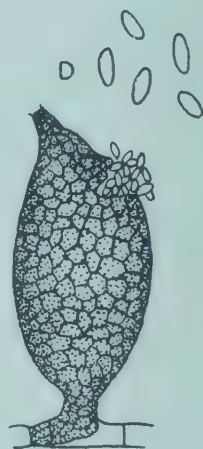
C

370. *Sclerotiopsis*

A



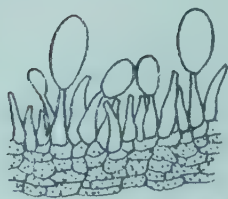
B



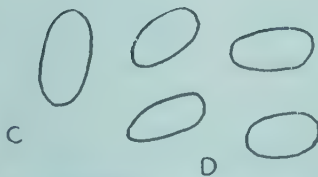
C

371. *Ampelomyces*

A

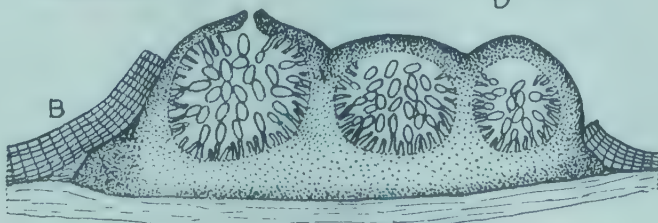
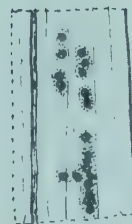


B

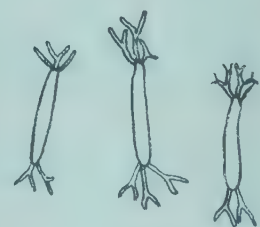


C

D

372. *Dothiorella*

A



C



B

373. *Dilophospora*

374. PLEUOSTROMELLA Petr. Pycnidia tufted thickly or hairy, on stroma, with or without ostioles; conidiophores long, simple or branched, septate; conidia 1-celled, hyaline, borne at the apex and on sides at the septa of the conidiophore.

Fig. 374. *P. delitiscens*; original, from herbarium material on bark of *Prunus*. A, habit of pycnidia in bark; B, C, sections of stroma and pycnidia; D, conidiophores; E, conidia.

375. FUSICOCCUM Corda. Pycnidia in spherical or flattened, sub-epidermal, erumpent dark stroma, one to several per stroma; opening separately or with a common pore; conidiophores simple, short; conidia hyaline, 1-celled, fusoid; parasitic or saprophytic on wood.

Fig. 375. *F. ilicinum*; original, from herbarium material on dead branch of *Ilex opaca*. A, habit of pycnidia; B, section through stroma and pycnidium; C, conidiophores and conidia; D, conidia.

376. RABENHORSTIA Fr. Pycnidia borne in black, erumpent, sub-cortical stroma; stroma nearly globose, wider at the base, upper part truncate, often circularly split at the top, divided into several cavities; conidiophores filiform, simple, septate; conidia hyaline, 1-celled, ovoid to oblong; saprophytic on branches.

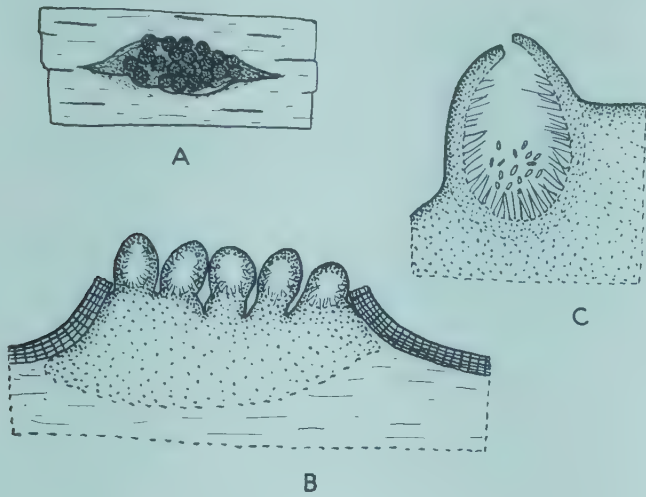
Fig. 376. *R. tiliae*; original, from herbarium material on dead branch of *Tilia*. A, habit of pycnidia; B, section through stroma; C, conidiophores; D, conidia.

377. CYTOSPORA Ehrenb. Pycnidia within a superficial or erumpent, tuberculate, globose, stroma; cavities irregular, incompletely separate; conidiophores slender; conidia hyaline, 1-celled, elongate-curved (allantoid); parasitic or saprophytic on wood. Mostly imperfect stages of *Valsa*.

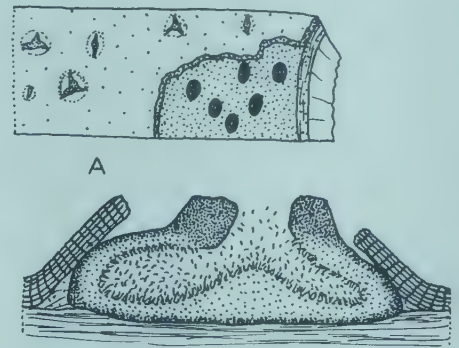
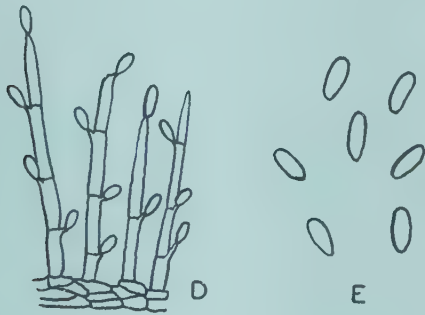
Fig. 377. *C. (Valsa) leucostoma*; original, from herbarium material on twigs of *Prunus domestica*. A, habit of stromata; B, section through stroma; C, conidiophores; D, conidia.

378. CYTOSPORELLA Sacc. Pycnidia forming irregular cavities within erumpent, tuberculate stroma; conidiophores slender, simple or branched; conidia hyaline, 1-celled, ovoid to oblong; parasitic or saprophytic on wood; similar to *Cytospora* except for shape of conidia.

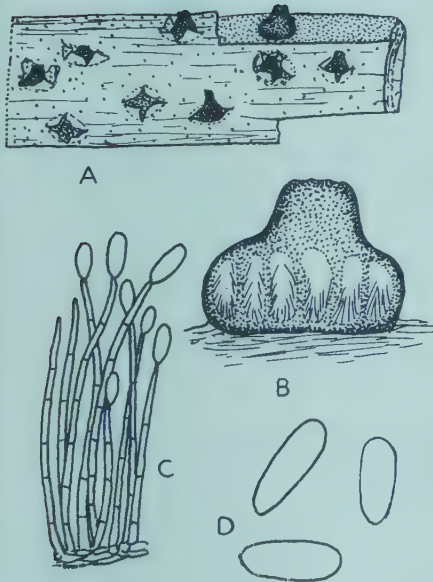
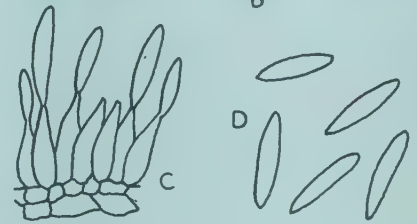
Fig. 378. *C. carnea*; original, from herbarium material on dead twigs of *Castanea dentata*. A, habit of stromata; B, section through stroma; C, conidiophores and conidia.



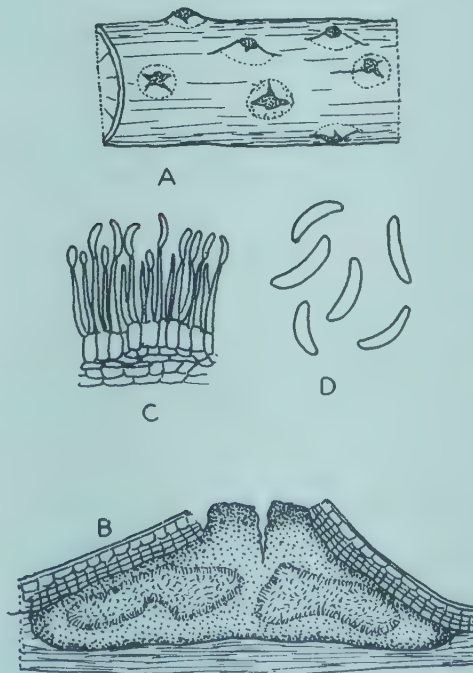
374. *Pleurostromella*



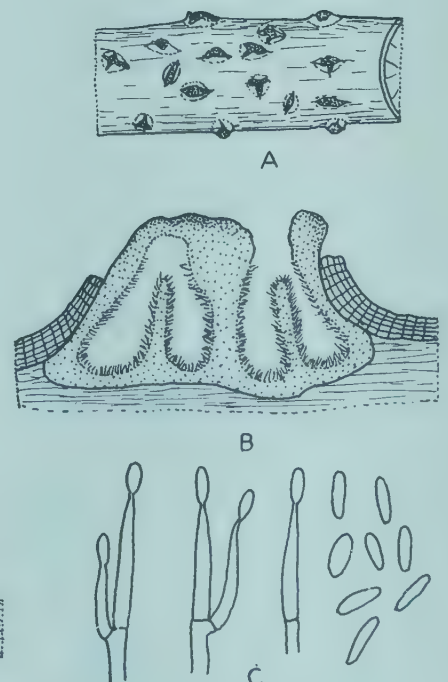
375. *Fusicoccum*



376. *Rabenhorstia*



377. *Cytospora*



378. *Cytosporella*

379. SPORONEMA Desm. Pycnidia subepidermal, slightly membranous, at first closed, later dehiscing radiately, gaping, dark; conidiophores slender, typically branched; conidia 1-celled, hyaline, ovoid to oblong; on leaves.

Fig. 379. *S. phacidoides*; redrawn from Jones (169). Other reference (178).

380. CATINULA Lev. Pycnidia mostly globose-ovoid, dark, superficial, membranous-leathery, rather firm and solid, or somewhat fleshy when wet, nearly smooth, gaping at the top with a large mouth, often brightly colored when fresh; conidiophores simple or branched; conidia 1-celled, subhyaline, globose to oblong.

Fig. 380. *C. thujae*; original, from herbarium material on *Thuja plicata*. A, habit of pycnidia on leaves; B, pycnidium; C, conidiophores; D, conidia.

381. AMEROSPORIUM Speg. Pycnidia superficial, subcupulate, opening wide at apex, black, surrounded by long, pointed, black setae; conidiophores crowded, branched; conidia 1-celled, hyaline to subhyaline, without bristles, cylindrical to ellipsoid; saprophytic.

Fig. 381. *A. caricum*; original, from herbarium material on *Carex* leaves. A, habit of pycnidium on leaf; B, pycnidium; C, seta; D, conidiophore; E, conidia.

382. PETRAKOMYCES Subram. and Ramakr. Stroma enclosing pycnidial cavity, without ostiole, opening by an elongate cleft; conidiophores simple, arising from the entire inner surface of the pycnidial cavity; conidia 1-celled, hyaline, with a simple, apical, long, filamentous appendage; on living leaves.

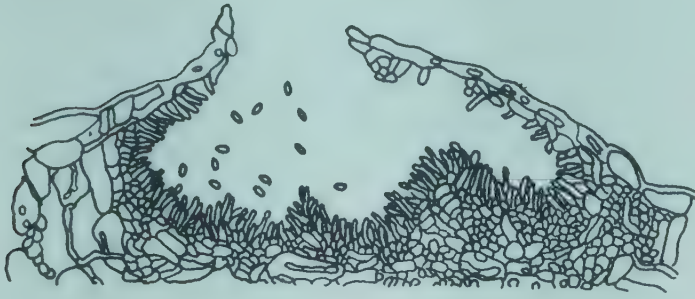
Fig. 382. *P. indicus*; redrawn from Subramanian and Ramakrishnan (265). A, section through stroma and pycnidial cavity; B, conidia with appendages.

383. SHANORIA Subram. and Ramakr. Stromata black, carbonaceous, with one or more locules, lined with conidiophores, at maturity dehiscing by an irregular longitudinal rupture; conidiophores simple, cylindrical or clavate; conidia 1-celled, hyaline, with a filiform subapical appendage at each end.

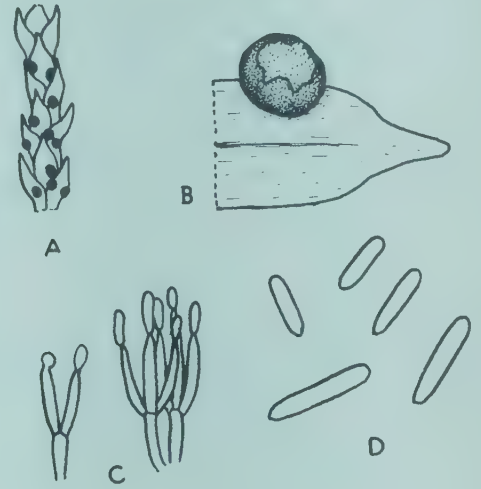
Fig. 383. *S. bambusarum*; redrawn from Shanor (231). A, habit of stromata in leaf; B, section through stroma and pycnidia; C, conidiophores and conidia. Other reference (268).

384. DOTHICHIZA Lib. Pycnidia subglobose, smooth, dark, erumpent from bark, somewhat disc-shaped, irregularly dehiscent; conidiophores simple, slender; conidia 1-celled, hyaline, ovoid to cylindrical.

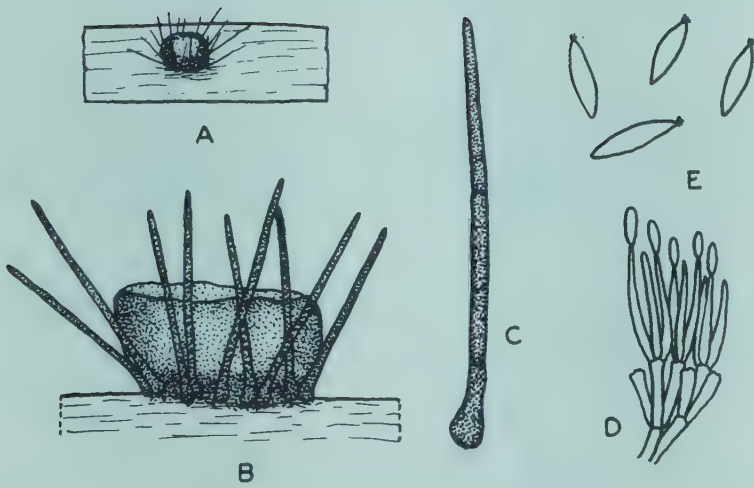
Fig. 384. *D. populae*; original, from herbarium material on *Populus* sp. A, habit of pycnidia on wood; B, section of pycnidium; C, conidiophores; D, conidia.



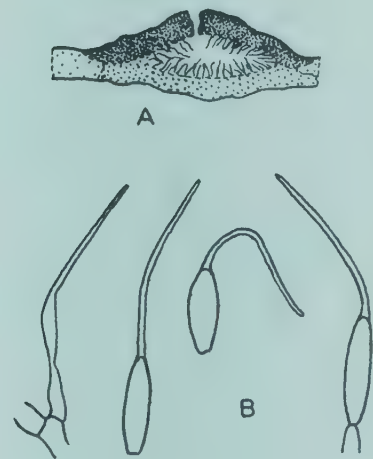
379. *Sporonema*



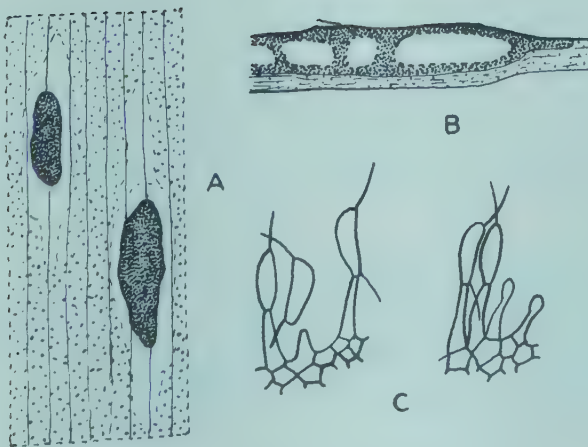
380. *Catinula*



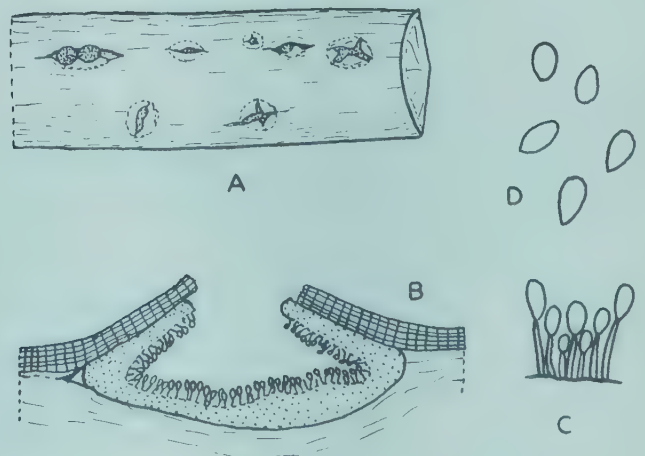
381. *Amerosporium*



382. *Petrakomyces*



383. *Shanoria*



384. *Dothichiza*

385. *DINEMASPORIUM* Lev. Pycnidia black, cup-shaped, superficial, with long dark setae; conidiophores rod-shaped, mostly simple; conidia hyaline, 1-celled, elongate or allantoid, with a slender appendage at each end; saprophytic.

Fig. 385. *Dinemasporium* sp.; original, from fresh material on dead grass stem. A, habit of pycnidia; B, side view of pycnidium; C, top view of pycnidium, enlarged; D, seta; E, conidia.

386. *ANTHASTHOOPA* Subram. and Ramakr. Pycnidia immersed, with membranous wall, without stroma; conidiophores produced from surface of a cushion-shaped mound of tissue at base of pycnidial cavity; conidia 1-celled, hyaline, concave-convex in outline, each with an apical, hyaline, mucoid appendage turned backwards and closely appressed to the concave side of the conidium; saprophytic.

Fig. 386. *A. simba*; redrawn from Sumbramanian and Ramakrishnan (266). A, section through pycnidium; B, conidia with appendages.

387. *SCHIZOTHYRA* Batista and Costa. Pycnostroma subcuticular, globose-depressed, dark, carbonaceous, radiate, margin irregular, dehiscent, unilocular, conidiophores lining entire cavity, short; conidia 1-celled, hyaline, rod-shaped, catenulate.

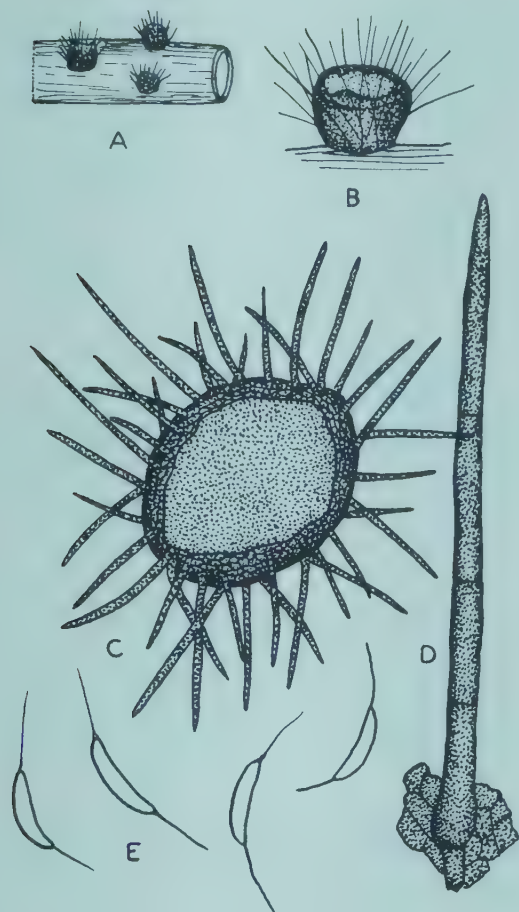
Fig. 387. *S. minuta*; redrawn from Batista *et al.* (18). A, section through pycnidial cavity; B, conidia.

388. *CREOTHYRIELLA* Batista and Costa. Pycnostroma superficial, rounded, shield-shaped, flattened, brown, smooth, irregularly dehiscent, with several globoid locules; conidiophores filamentous, on all sides of the locules; conidia 1-celled, hyaline, cylindrical to ellipsoid, catenulate.

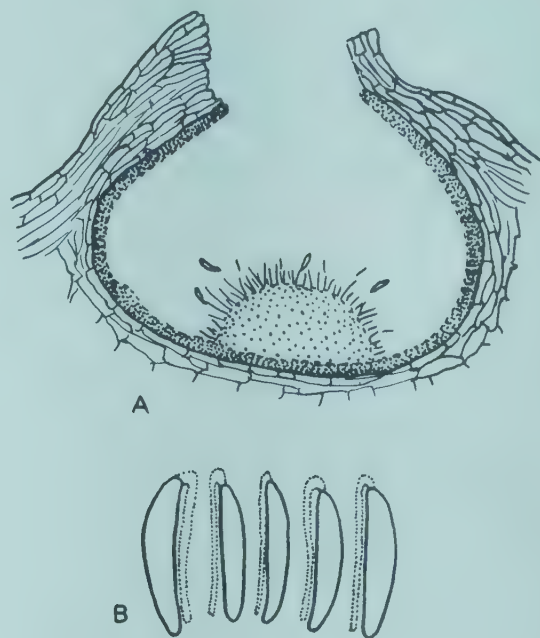
Fig. 388. *C. sideroxyfoliae*; redrawn from Batista (15). A, section through stroma; B, conidia.

389. *HAINESIA* Ellis and Sacc. Pycnidia fleshy to gelatinous, bright-colored, globose at first, opening and becoming discoid, erumpent; conidiophores long, slender, branched; conidia hyaline, 1-celled, oblong to fusoid or somewhat allantoid; saprophytic.

Fig. 389. *H. rubi*; original, from herbarium material on leaves of cultivated *Rubus*. A, habit of pycnidia; B, section through open pycnidium; C, conidiophores and conidia.



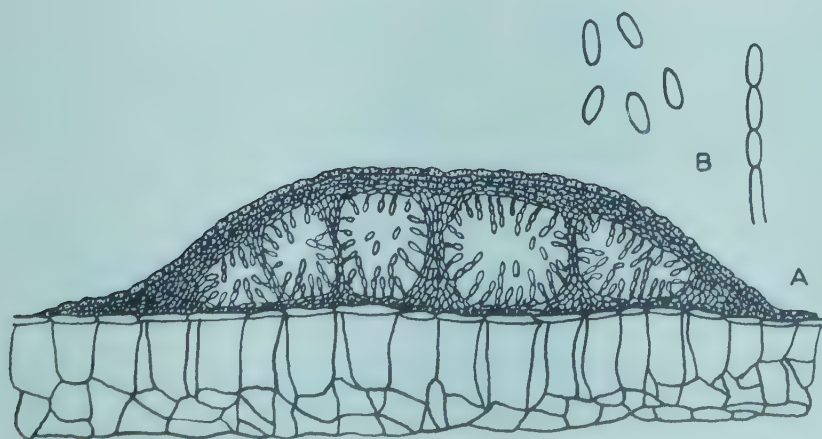
385. *Dinemasporium*



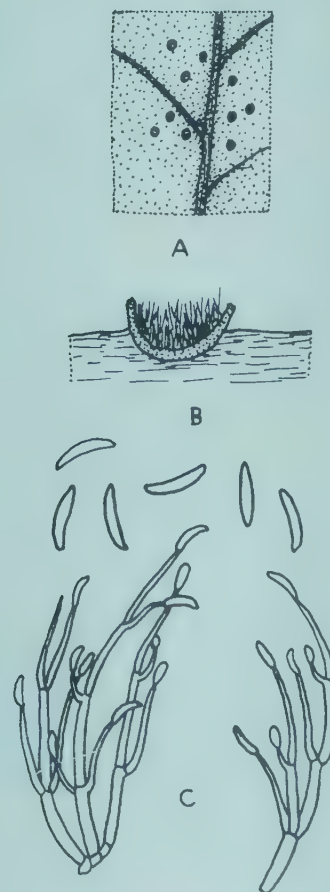
386. *Anthasthoopa*



387. *Schizothyra*



388. *Creothyriella*



389. *Hainesia*

390. *ASCHERSONIA* Mont. Pycnidia in brightly-colored, hemispherical or cushion-shaped stromata, somewhat sunken, opening by wide pores or ruptures which join to form irregular cracks; conidiophores slender, branched; conidia hyaline, usually 1-celled, but sometimes reported as being septate, fusoid; saprophytic or some species parasitic on insects.

Fig. 390. *A. aleyrodis*; original, from herbarium material on *Aleyrodes citri* on leaves of citrus. A, habit of stromata covering insects; B, section through stroma and pycnidia; C, conidiophores; D, conidia.

391. *ACTINOPELTE* Sacc. Pycnidia superficial, borne on a stalk or columella, dimidiate, shield-shaped, black, coalescing or scattered, ostiole variable; conidiophores simple; conidia hyaline, less often brownish, 1-celled, ovoid, oblong or fusoid; parasitic on leaves.

Fig. 391. *A. (Leptothyrium) dryina*; original, from fresh material on leaves of *Quercus coccinea*. A, habit of pycnidia in leaf spot; B, pycnidium, top view; C, pycnidium, lower surface showing conidiophores and conidia; D, conidiophores and conidia. Reference (275).

392. *MELASMIA* Lev. Pycnidia in a broad, black, flattened stroma which is superficial or nearly so, dimidiate; conidiophores simple or branched; conidia hyaline or subhyaline, 1-celled, allantoid or fusoid; parasitic on leaves; imperfect stages of *Rhytisma*.

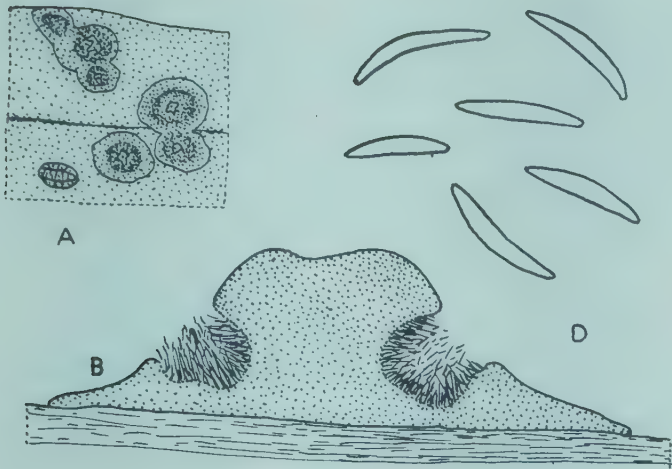
Fig. 392. *M. hypophylla*; original, from herbarium material on leaves of *Gleditsia triacanthos*. A, habit of pycnidia; B, section through pycnidium; C, conidiophores; D, conidia.

393. *LEPTOTHYRIUM* Kunze. Pycnidia superficial or erumpent, dimidiate, shield-shaped, dark, with or without ostiole; conidiophores simple; conidia hyaline, 1-celled, ovoid, oblong or curved; parasitic on leaves, fruit, etc.

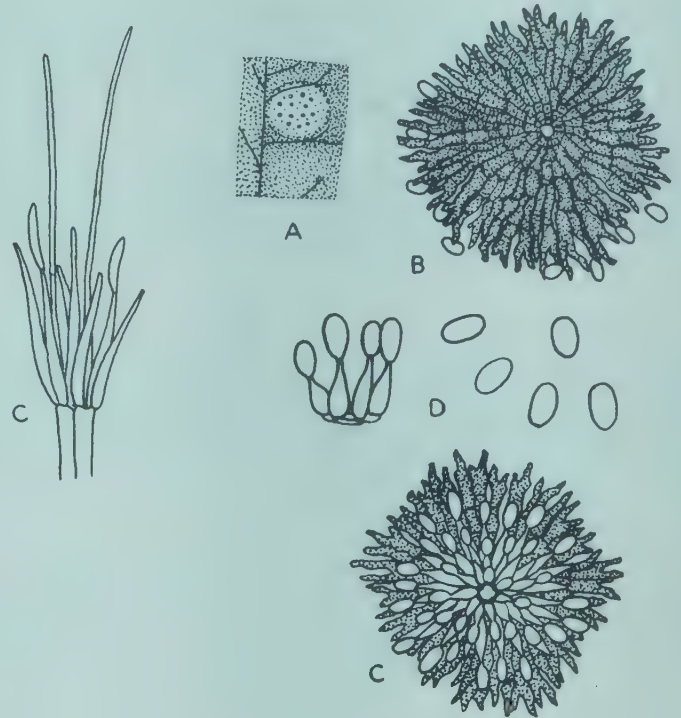
Fig. 393. *L. lonicerae*; original, from herbarium material on leaves of *Lonicera involucrata*. A, B, habit of pycnidia; C, pycnidium breaking open; D, conidia.

394. *LEPTOSTROMA* Fr. Pycnidia black, separate, dimidiate, sub-superficial, flattened to elongate, more or less cleft lengthwise; conidiophores short, simple, 1-celled; conidia hyaline, 1-celled, ovoid, elongate or allantoid; parasitic or saprophytic; probably imperfect forms of *Hysteriaceae*.

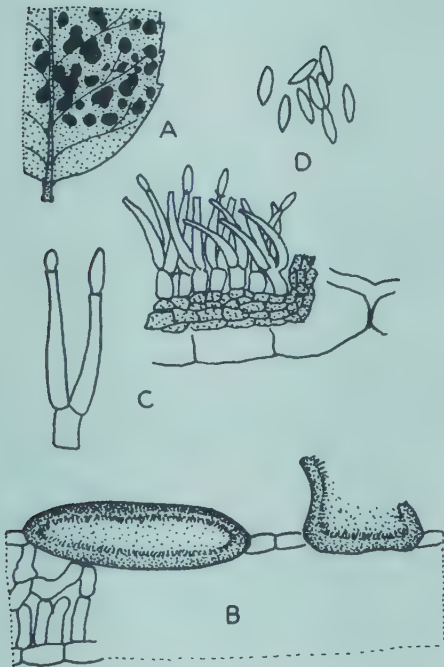
Fig. 394. *L. actaea*; original, from herbarium material on *Cimicifuga racemosa*. A, habit of pycnidia; B, C, pycnidia enlarged; D, section of pycnidium; E, conidiophores and conidia.



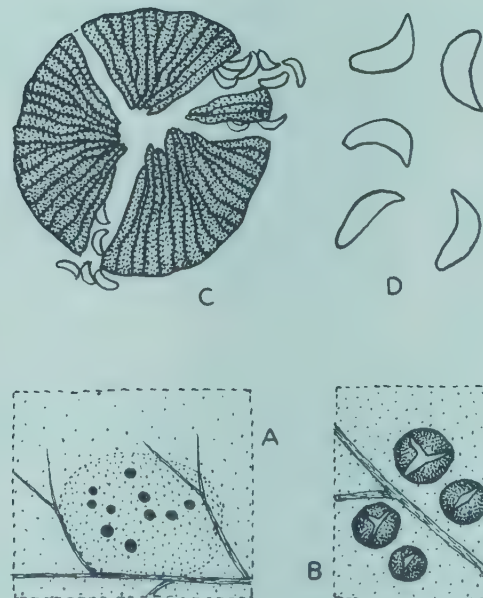
390. *Aschersonia*



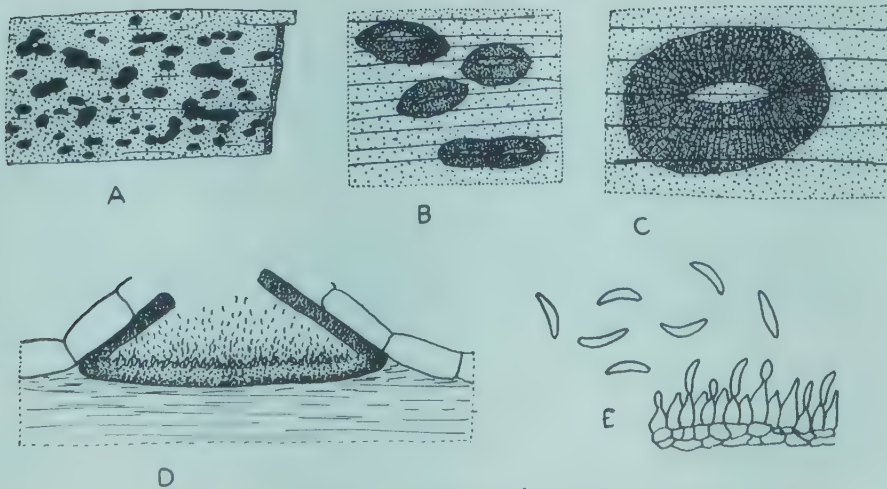
391. *Actinopelte*



392. *Melasmia*



393. *Leptothyrium*



394. *Leptostroma*

395. CONIOTHYRIUM Sacc. Pycnidia black, globose, separate, erumpent, ostiolate; conidiophores short, simple; conidia small, dark, 1-celled, ovoid or ellipsoid; parasitic or saprophytic.

Fig. 395. *Coniothyrium* sp.; original, from fresh material on rose stems and culture obtained from rose. A, habit, necrotic spot and pycnidia; B, pycnidia in culture; C, conidiophores and conidia.

396. HARKNESSIA Cooke. Pycnidia globose, conical, thin, white, porous-lacerate at the apex, bursting out through the leaf tissue; conidiophores filiform; conidia dark, 1-celled, ellipsoid to ovoid, drawn out into a hyaline pedicel (conidiophore); saprophytic on leaves.

Fig. 396. *H. eucalypti*; original, from herbarium material on *Eucalyptus* leaves. A, habit of pycnidia; B, top and side views of pycnidia enlarged; C, section through pycnidium; D, conidiophores and conidia.

397. CHAETOMELLA Fuckel. Pycnidia black, superficial, separate, without ostiole, covered sparsely with dark bristles; conidiophores simple or branched; conidia dark to subhyaline, 1-celled, fusoid to somewhat curved; saprophytic.

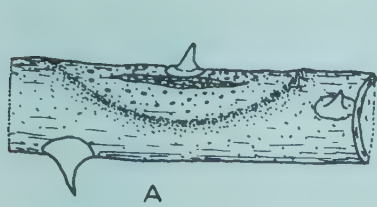
Fig. 397. *C. atra*; original, from herbarium material on dead stalks of *Sorghum vulgare*. A, habit of pycnidia; B, pycnidium enlarged; C, bristle; D, conidiophore and conidia. Reference (220).

398. SPHAEROPSIS Sacc. Pycnidia black, separate or grouped globose, erumpent, ostiolate; conidiophores short; conidia large, dark, 1-celled, ovoid, elongate or somewhat irregular; parasitic.

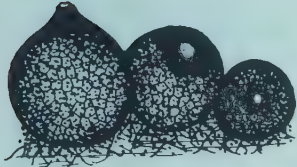
Fig. 398. *S. malorum* (*Physalospora obtusa*); original, from herbarium material on apple leaf, fruit and from culture. A, pycnidia in leaf spot; B, section of pycnidium in fruit; C, conidia from culture.

399. PROTOSTROMA Batista. Pycnostroma subcuticular on leaves, sessile, oblong, membranous, without ostioles, brown, with one or more locules; conidiophores minute, hyaline; conidia 1-celled, at first hyaline, then dark, verrucose.

Fig. 399. *P. hyphaeneae*; redrawn from Batista (15). A, section through stroma; B, mature conidia.



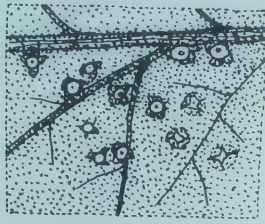
A



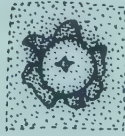
B



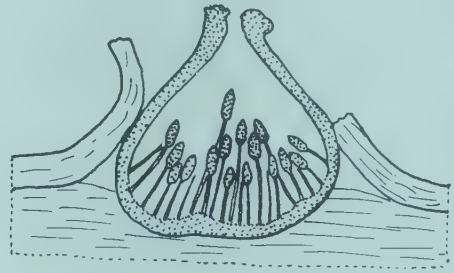
C

395. *Coniothyrium*

A



B

396. *Harknessia*

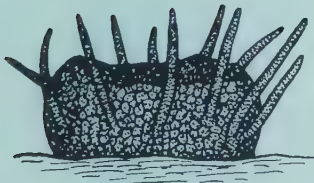
C



D



A



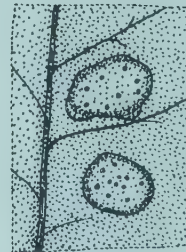
B



C



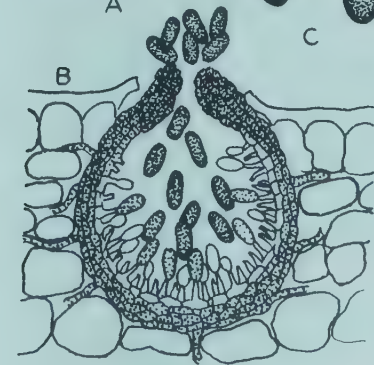
D

397. *Chaetomella*

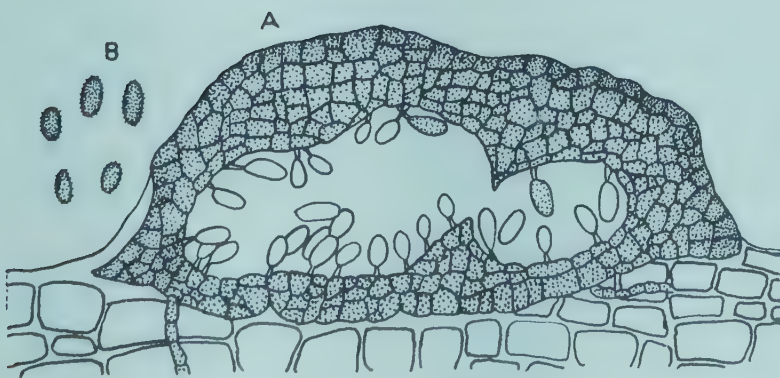
A



C



B

398. *Sphaeropsis*

A



B

399. *Protostroma*

400. HAPLOSPORELLA Speg. Pycnidia clustered in a black, wart-like, stroma which bursts out of the bark, papillate; conidiophores simple; conidia large, dark, 1-celled, ovoid or oblong; parasitic or saprophytic. The genus has been considered as being synonymous with *Sphaeropsis*, but the latter is described as having no stroma.

Fig. 400. *H. longipes*; original, from herbarium material on dead limbs of *Morus alba*. A, habit of pycnidia and stromata; B, section through stroma; C, conidiophores, conidia and sterile hyphae; D, conidia.

401. RHYNCHOPHOMA Karst. Pycnidia separate, not on leaves, somewhat globose, beaked, bursting out of substrate (usually bark) or superficial, opening by a large pore; conidiophores simple or branched; conidia 2-celled, hyaline, ovoid-oblong.

Fig. 401. *R. raduloides*; original, from herbarium material on stems of *Ribes bracteosum*. A, habit of pycnidium in bark; B, section of pycnidium; C, conidiophores; D, conidia.

402. PIGGOTIA Berk. and Br. Pycnidia separate, flattened, inequilateral, thin, later with a stellate cap which is pushed off; conidiophores cylindric, septate; conidia very small, dark, 1-celled, ovoid to elongate; parasitic on leaves; probably spermagonial stage of certain leaf spot fungi.

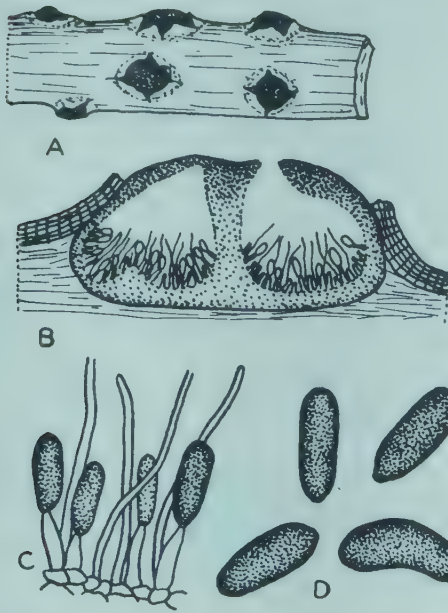
Fig. 402. *P. negundinis*; original, from herbarium material on leaves of *Acer negundo*. A, habit of pycnidia; B, section through pycnidia; C, conidiophores; D, conidia. Reference (298).

403. DARLUCA Cast. Pycnidia black, spherical, ostiolate, superficial, located in rust sori; conidia hyaline, 2-celled, ellipsoid or fusoid to oblong, tipped with mucous or bristly-like appendages at both ends; parasitic on rust fungi, chiefly on uredia.

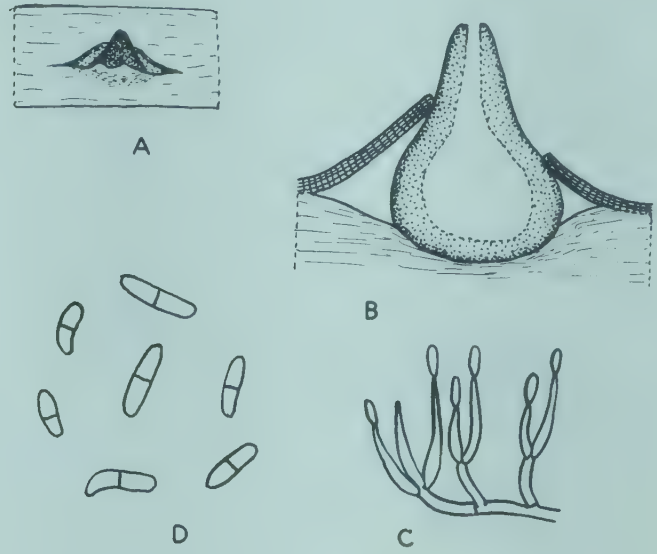
Fig. 403. *D. filum*; original, from dried material of *Puccinia* on grass leaf. A, B, habit of pycnidia in uredia; C, section through uredium of rust showing pycnidia; D, conidia.

404. LICHENOCONIUM Petrak and Syd. Pycnidia innate, becoming erumpent, opening irregularly and becoming more or less cup-shaped, dark, single; conidiophores distinct, simple, hyaline; conidia 1-celled, dark, ovoid to oblong; parasitic on lichens.

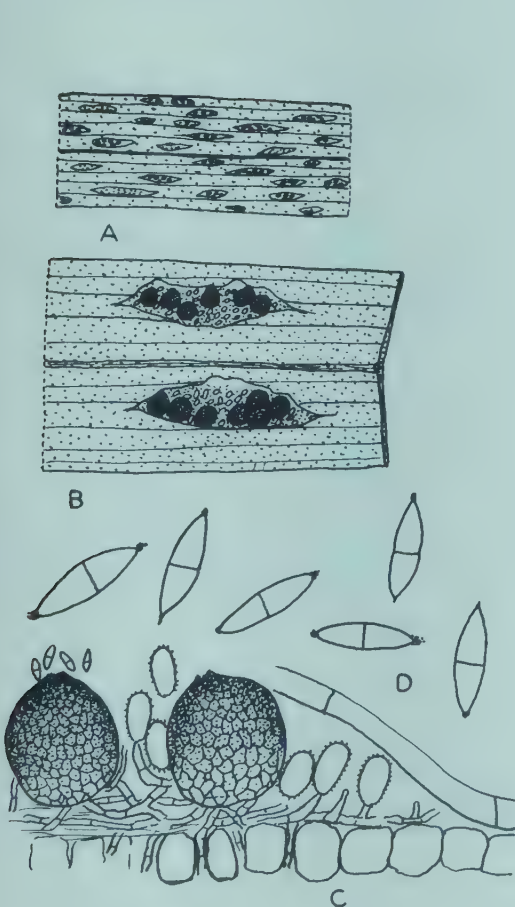
Fig. 404. *L. xanthoriae*; redrawn from Christiansen (50). A, B, pycnidia; C, conidiophores; D, conidia.



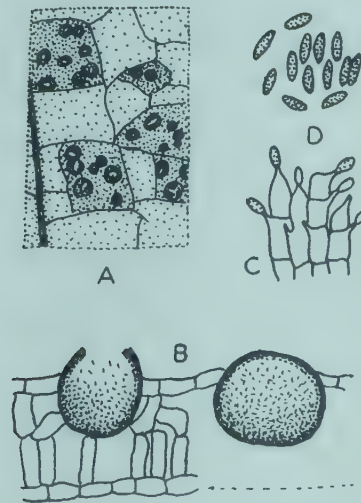
400. *Haplosporella*



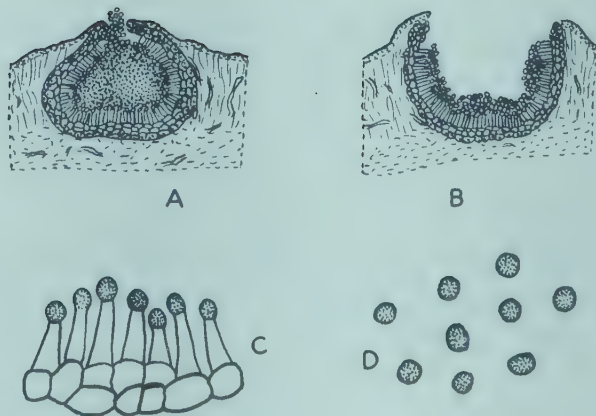
401. *Rhynchophoma*



403. *Darluca*



402. *Piggotia*



404. *Lichenocodium*

405. ASCOCHYTA Lib. Pycnidia dark, globose, separate, immersed in host tissue, ostiolate; conidia hyaline, 2-celled, ovoid to oblong; parasitic, principally causing leaf spots.

Fig. 405. *Ascochyta* sp.; original, from fresh and dried material on barley leaf. A, habit of pycnidia in leaf spot; B, C, top and side views of pycnidia; D, conidia.

406. DIPLODINA Westend. Pycnidia black, separate, immersed or erumpent, globose or flattened, ostiolate; conidiophores simple, slender; conidia hyaline, 2-celled, ovoid or ellipsoid; parasitic or saprophytic; similar to *Ascochyta* but not produced in spots.

Fig. 406. *D. macrospora*; original, from herbarium material on dead twigs of *Cornus*. A, habit of pycnidia; B, section through pycnidium; D, conidiophores; D, conidia.

407. VASUDEVELLA Chona, Munjal and Baja. Pycnidia subepidermal, dark brown, with ostiole; conidiophores short, 1-celled, hyaline, ellipsoid to slightly curved, bearing a filiform, dichotomously branched apical appendage; saprophytic.

Fig. 407. *V. sporoboli*; redrawn from Chona *et al.* (48). A, section of pycnidium; B, conidia.

408. ROBILLARDA Sacc. Pycnidia brown to pale, in spots, erumpent to subsuperficial, globose to flattened, with small ostiole; conidia hyaline, 2-celled, cylindrical, with 3-4 hyaline setae at one end; parasitic on grasses, causing leaf spots.

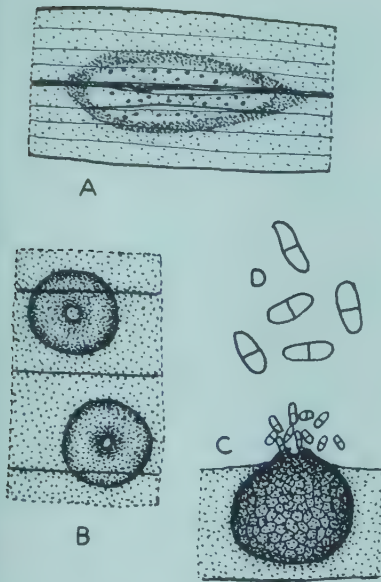
Fig. 408. *R. phragmites*; redrawn from Cunneil (59). Other references (244, 245). A, B, pycnidia; C, conidia with appendages.

409. KELLERMANNIA Ellis and Everh. Pycnidia black, globose, separate, immersed in host tissue, ostiolate; conidiophores short, simple; conidia hyaline, mostly 2-celled, cylindrical with an awl-shaped appendage at the tip; parasitic or saprophytic.

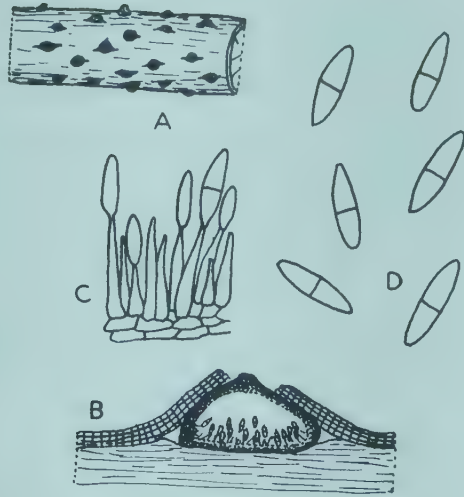
Fig. 409. *K. yuccaegena*; original, from herbarium material on *Yucca angustifolia*. A, habit of pycnidia; B, section of *Yucca* leaf showing location of pycnidia; C, section of pycnidium; D, conidiophores; E, conidia.

410. DIPLODIA Fr. Pycnidia black, single, globose, immersed, erumpent, ostiolate; conidiophores slender, simple; conidia dark, 2-celled, ellipsoid or ovoid; parasitic or saprophytic.

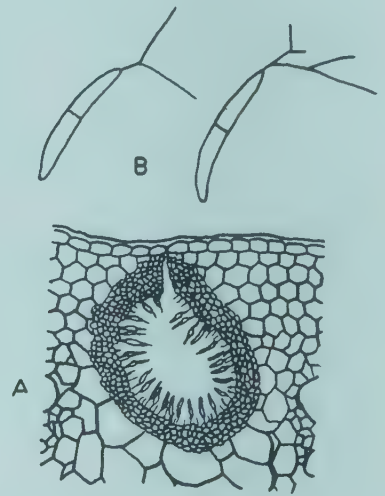
Fig. 410. *D. zeae*; original, from herbarium material on dead corn stalk and from culture. A, B, habit of pycnidia; C, pycnidium from culture; D, conidia.



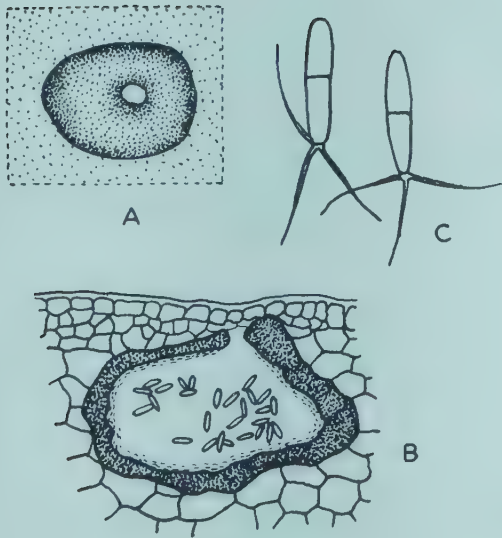
405. *Ascochyta*



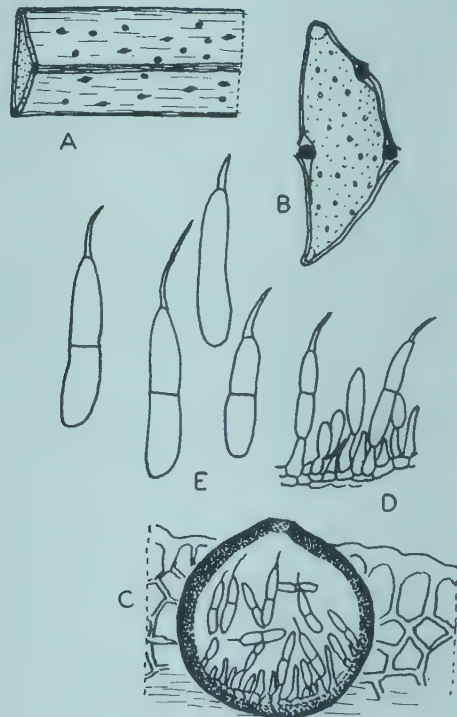
406. *Diplodina*



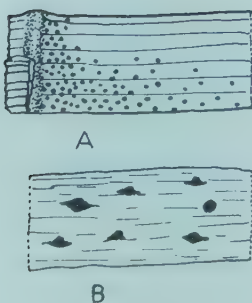
407. *Vasudevella*



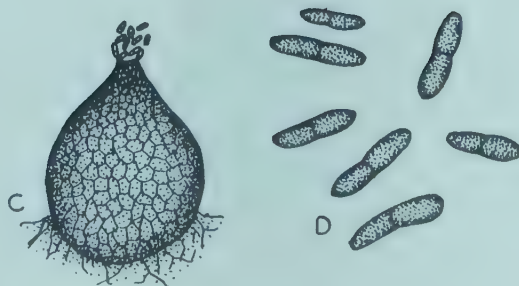
408. *Robillarda*



409. *Kellermannia*



410. *Diplodia*



411. *BOTRYODIPLODIA* Sacc. Pycnidia black, ostiolate, erumpent, stromatic, confluent; conidiophores simple, short; conidia dark and 2-celled at maturity, ovoid to elongate; parasitic or saprophytic on twigs. This genus may be confused with *Macrophoma* or *Dothiorella*, if only immature conidia are present.

Fig. 411. *B. acerina*; original, from herbarium material on twigs of *Acer*. A, B, habit of pycnidia and stromata; C, section through pycnidium; D, conidiophores; E, conidia.

412. *APIOCARPELLA* Syd. Pycnidia brown, globose, ostiolate, erumpent; conidia hyaline, typically unequally 2-celled, long-ovoid or ellipsoid; parasitic, causing leaf spots on grasses.

Fig. 412. *A. macrospora*; conidia, redrawn from Sprague (243).

413. *CILIOCHORELLA* Syd. em. Subram, and Ramakr. Pycnidia black, circular, flattened, without stoma, dehiscing around the margin, unilocular, basal part fertile; conidiophores short, stout, simple; conidia hyaline, 4-celled, somewhat curved, apical cell with one terminal and one lateral appendage, basal cell with a terminal appendage.

Fig. 413. *C. magniferae*; redrawn from Subramanian and Ramahrishnan (268). A, conidiophores and immature conidia; B, mature conidia.

414. *STAGONOSPORA* Sacc. Pycnidia dark, separate, superficial or erumpent, globose, ostiolate; conidiophores short; conidia hyaline, typically 3- or more-celled, cylindrical to elliptical; parasitic or saprophytic on leaves and stems.

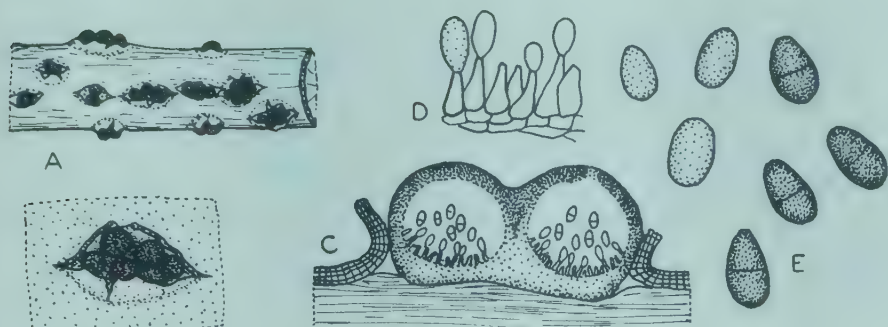
Fig. 414. *S. carpathica*; original, from herbarium material on leaves of *Trifolium repens*. A, B, habit of pycnidia; C, section through pycnidium; D, conidiophores; E, conidia. Reference (58).

415. *ARISTATOMA* Tehon. Pycnidia brown, globose, erumpent, ostiolate, separate, bearing dark brown setae near the ostiole; conidiophores short, simple; conidia hyaline, several celled, cylindrical; parasitic, causing leaf spots.

Fig. 415. *A. oeconomicum*; original, from herbarium material on leaves of *Vigna sinensis*. A, B, habit of pycnidia; C, section through pycnidium; D, conidia. Reference (176).

416. *HETEROPATELLA* Fuckel. Pycnidia cupulate or discoid, subsuperficial; conidia hyaline, mostly 2-septate, with a single apical appendage; parasitic or saprophytic.

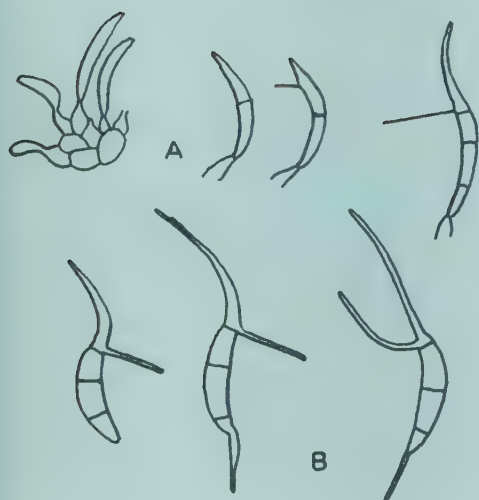
Fig. 416. *H. alpina* (*H. umbilicata*); conidia, redrawn from Sprague and Cooke (247).



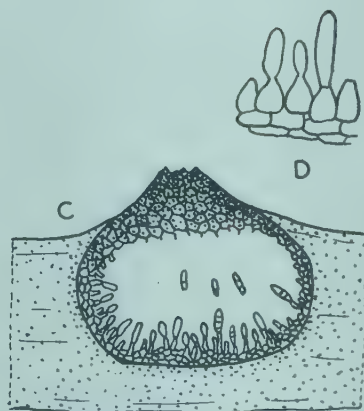
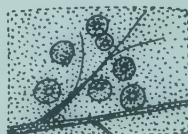
411. Botryodiplodia



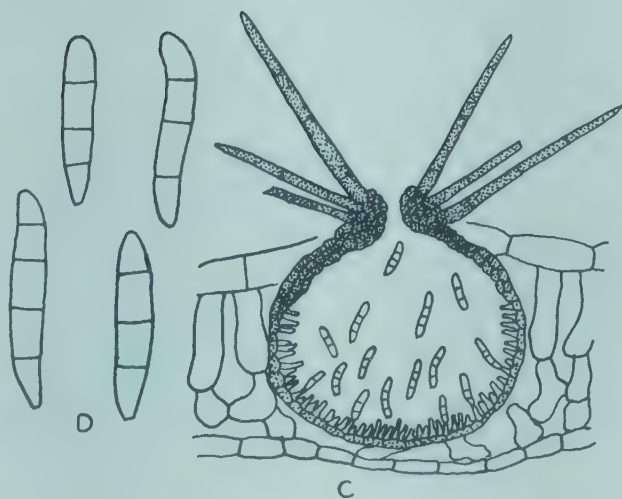
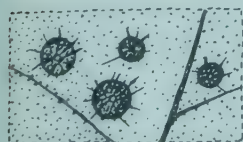
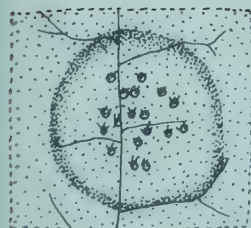
412. Apiocarpella



413. Ciliochorella



414. Stagonospora



415. Aristatoma



416. Heteropatella

417. DISCOSIA Lib. Pycnidia black, separate, circular, flattened, between the epidermis and cuticle; conidiophores short, simple; conidia hyaline, several-celled, allantoid to fusoid, with single appendage at each end; parasitic.

Fig. 417. *D. maculicila*; original, from herbarium material on *Smilax* leaves. A, habit of pycnidia; B, single pycnidium, top view; C, section of pycnidium; D, conidiophores and conidia. Reference (116).

418. CATINOPELTIS Batista and Costa. Pycnostroma subcuticular, subglobose to hemispherical, brown to light brown, radiating, with ostiole, unilocular, entire lining of cavity bearing conidia; conidiophores cylindrical, short; conidia several-celled, hyaline, fusoid.

Fig. 418. *C. recifensis*; redrawn from Batista *et al.* (18). A, section through stroma; B, conidia.

419. HENDERSONULA Speg. Pycnidia black, stromate, 1 to several per stroma, locules occurring at different levels in stroma; conidiophores long, flexuous; conidia often extruded in cirri; at first 1-celled, hyaline to yellowish, later becoming 3-celled and dark; parasitic or saprophytic on wood or bark.

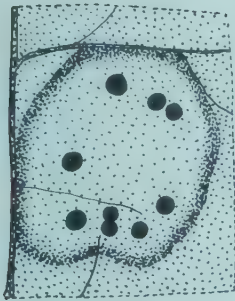
Fig. 419. *H. toruloidea*; A, B, pycnidial stage and conidia, redrawn from Wilson (292); C, *Torula* stage, original, from culture.

420. BARTALINIA Tassi. Pycnidia dark, globose, separate, ostiolate, innate or erumpent; conidiophores short; conidia hyaline, usually 4-celled, the lower cell tapering, appendages delicate, arising from apical cell, usually 3 or 4; saprophytic.

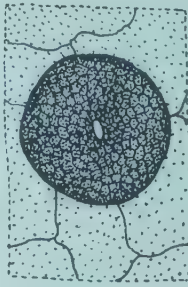
Fig. 420. *B. nolinae*; A, top view of pycnidium; B, section through pycnidium; C, conidia; drawn from photographs from Pollack (213).

421. DOTHISTROMA Hulbray. Stroma dark, elongate, innate, becoming erumpent and swollen, with a stalk extending into the substratum, composed internally of dense, vertical hyphae; locules separate, one to several in the upper part of the stroma; conidiophores simple, slender; conidia several-celled, hyaline, long-cylindrical to filiform; on pine needles.

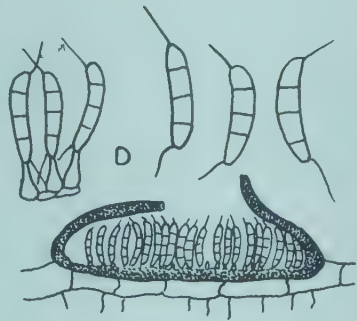
Fig. 421. *D. pini*; original, from herbarium material on needles of *Pinus nigra*. A, habit of pycnidia on pine needle; B, section through stroma and pycnidium; C, conidia. Reference (156).



A



B



C

417. Discosia

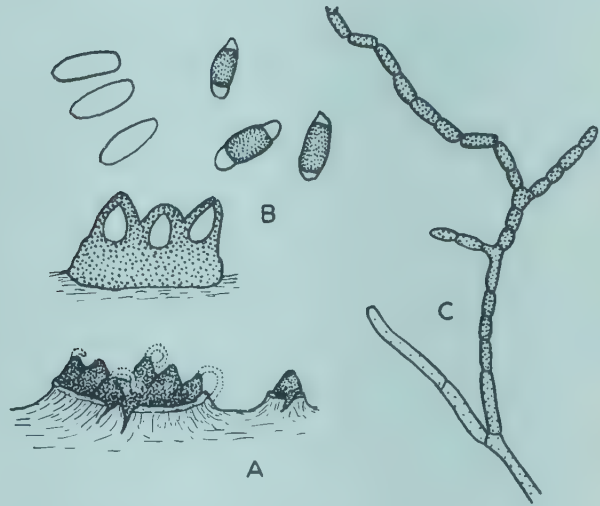


A



B

418. Catinopeltis



A



B

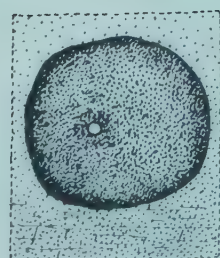


C

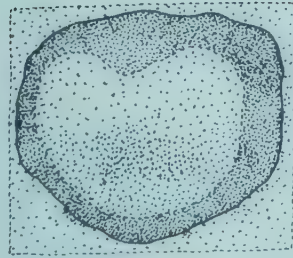
419. Hendersonula



C



A

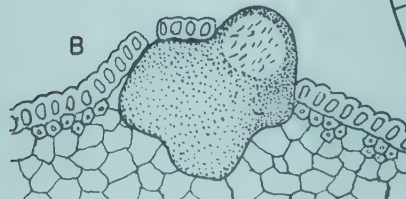


B

420. Bartalinia



A



B



C

421. Dothistroma

422. HENDERSONIA Sacc. Pycnidia dark, separate, globose, ostiolate, immersed, usually erumpent; conidia dark, several-celled, elongate to fusoid; saprophytic or parasitic.

Fig. 422. *H. celtifolia*; original, from herbarium material on leaves of *Celtis occidentalis*. A, habit of pycnidia; B, section through pycnidia; C, conidia.

423. PHLYCTAENA Mont. and Desm. Pycnidia dark, separate or sometimes confluent, developing in or under the epidermis or bark, closed or ostiolate, usually with one chamber or divided by irregular folds; conidiophores simple or forked; conidia hyaline, 1-celled, cylindrical or long spindle shaped, mostly bent, sickle-shaped; saprophytic.

Fig. 423. *P. albocincta*; original, from herbarium material on stem of *Rhus radicans*. A, habit of pycnidia; B, section through pycnidium; C, conidiophores; D, conidia.

424. PROSTHEMIUM Kunze. Pycnidia separate, covered, later breaking out, carbonaceous, globose-depressed, opening by a pore, dark; conidiophores filiform, hyaline, septate; conidia several-celled, dark, cylindrical to ellipsoid, stellately joined into few-spored groups.

Fig. 424. *P. betulinum*; original, from herbarium material on bark of *Betula alba*. A, habit of pycnidia in bark; B, section of pycnidium; C, conidia.

425. SPHAEROGRAPHIUM Sacc. Pycnidia black, separate, base globose, beak conical, spine-like, erumpent; conidiophores branched; conidia hyaline, 1- or 2-celled, filiform-fusoid, often curved; saprophytic.

Fig. 425. *S. fraxini*; original, from herbarium material on twig of *Fraxinus*. A, habit of pycnidia; B, single pycnidium; C, conidiophores and conidia.

426. PHLEOSPORA Wallr. Pycnidia dark, imperfectly formed, globose, innate in tissue, not in distinct spots; conidia hyaline or subhyaline, several-celled; elongate fusoid to filiform; parasitic or saprophytic.

Fig. 426. *P. robiniae*; original, from herbarium material on leaves of *Robinia pseudoacacia*. A, habit of pycnidia; B, section through pycnidium; C, conidia.



A

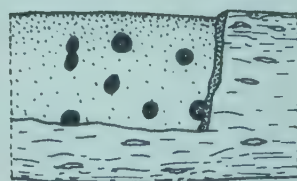


B



C

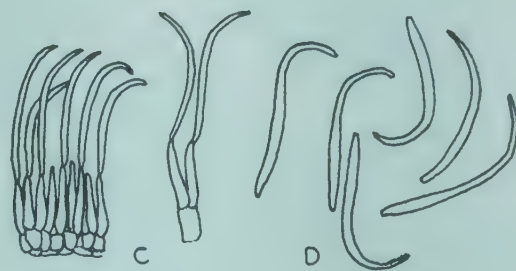
422. Hendersonia



A



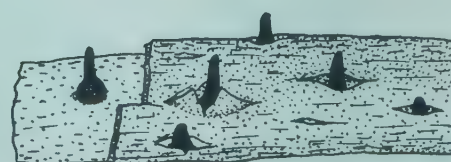
B



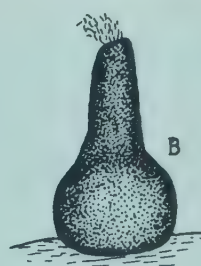
C

D

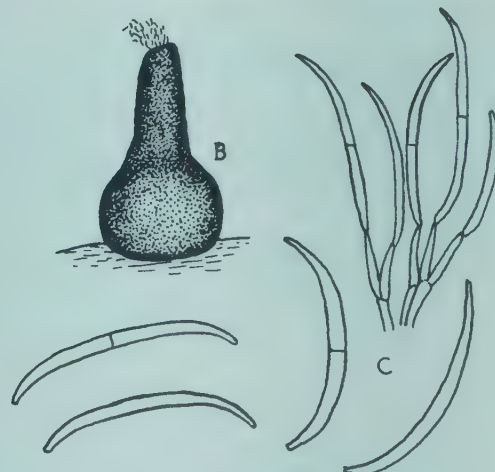
423. Phlyctaena



A



B

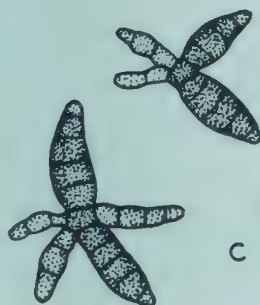


C

425. Sphaerographium



A

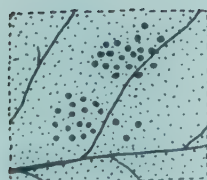


C

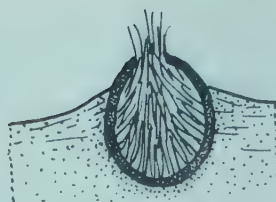


B

424. Prosthemium



A



B



C

426. Phleospora

427. SEPTORIA Sacc. Pycnidia dark, separate, globose, ostiolate, produced in spots, erumpent; conidiophores short; conidia hyaline, narrowly elongate to filiform, several septate; parasitic, typically causing leaf spots.

Fig. 427. *S. apii*; original, from dried material on leaves of *Apium*. A, habit of pycnidia; B, section through pycnidium; C, conidiophores and conidia.

428. MICROPERA Lev. Pycnidial cavities in yellowish to dark, waxy, erumpent stroma opening irregularly, with one or more irregular cavities; conidiophores simple or branched; conidia hyaline, septate, elongate-filiform, pointed at the ends; frequently sickle-shaped; parasitic or saprophytic.

Fig. 428. *M. abietina* (*Dermea balsamea*); original, from fresh material on branches of *Tsuga canadensis*. A, habit of stromata; B, section through stroma showing pycnidial cavities; C, conidiophore and conidia. Reference (229).

429. GELATINOSPORIUM Peck. Pycnidia stromatic, arising from a dark hypostroma, splitting open irregularly, tissue cartilaginous; conidiophores simple or branched; conidia hyaline, 1- or more-celled, narrowly spindle-shaped, bow-like, both ends pointed; saprophytic on branches.

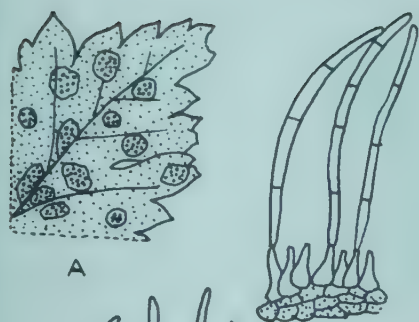
Fig. 429. *G. betulinum*; original, from herbarium material on *Betula lenta*. A, B, habit of pycnidial stroma; C, section of stroma; D, conidiophores and conidia.

430. RHABDOSPORA Mont. Pycnidia dark, separate, not produced in spots, erumpent, ostiolate; conidiophores short, simple; conidia hyaline, narrowly elongate to filiform, several septate; parasitic or saprophytic.

Fig. 430. *R. solidaginis*; original, from herbarium material on stem of *Solidago canadensis*. A, B, habit of pycnidia; C, section through pycnidium; D, conidia.

431. CHAETOSEPTORIA Tehon. Pycnidia complete, separate, spherical, innate, without clypeus, subicle or stroma, with ostiole, without beak, crowned with setae; conidia long, slender (scoleospores), several-celled, hyaline; parasitic on leaves, in spots.

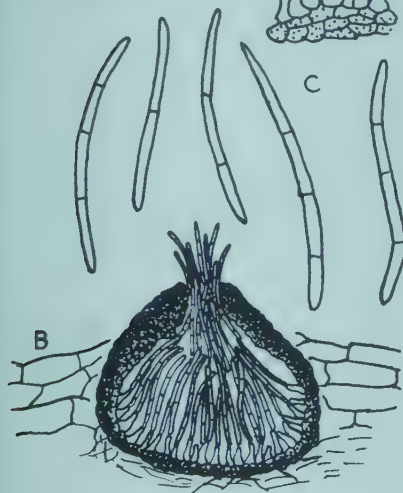
Fig. 431. *C. wellmanii*; redrawn from Yerkes (300). A, B, pycnidia; C, conidia.



A

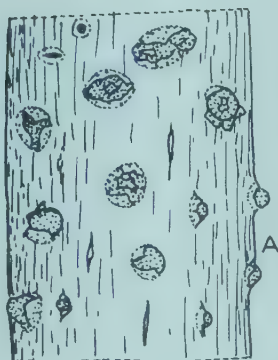


C

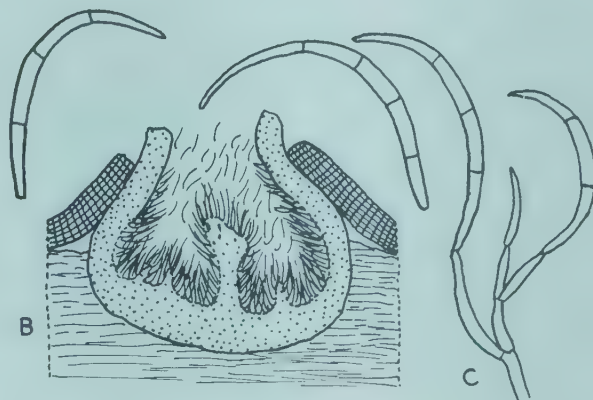


B

427. *Septoria*



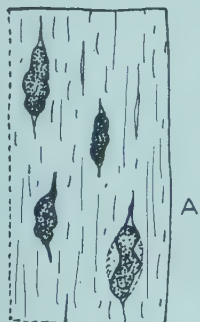
A



B

C

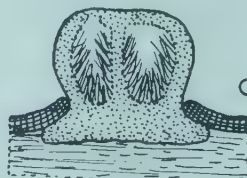
428. *Micropera*



A



B

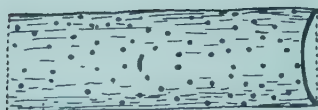


C

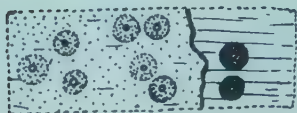


D

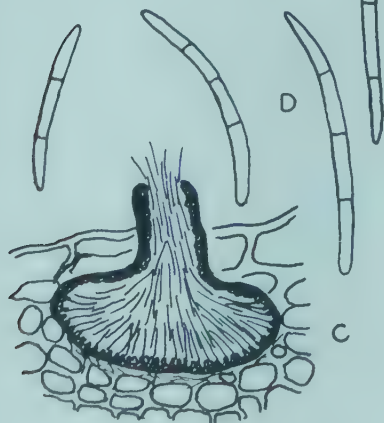
429. *Gelatinosporium*



A



B



C

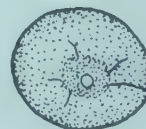
430. *Rhabdospora*



C



A



B

431. *Chaetoseptoria*

432. EPHELIS Fr. Stroma dark, or lighter when young, resembling unopened smut galls; pycnidia erumpent, open cupulate, somewhat gelatinous; conidia hyaline, 1-celled, acicular; parasitic on grasses; conidial stages of *Balansia*.

Fig. 432. *E. borealis* (*Balansia borealis*); original, from herbarium material on stems of grass. A, stroma and pycnidia; B, pycnidia enlarged; C, conidia. Reference (70).

433. LEPTOSTROMELLA Sacc. Pycnidia black, elongate, longitudinally cleft, at first covered and at maturity appearing superficial, flattened to depressed; conidiophores simple, short; conidia hyaline, 1 or more celled, elongate to filiform; saprophytic.

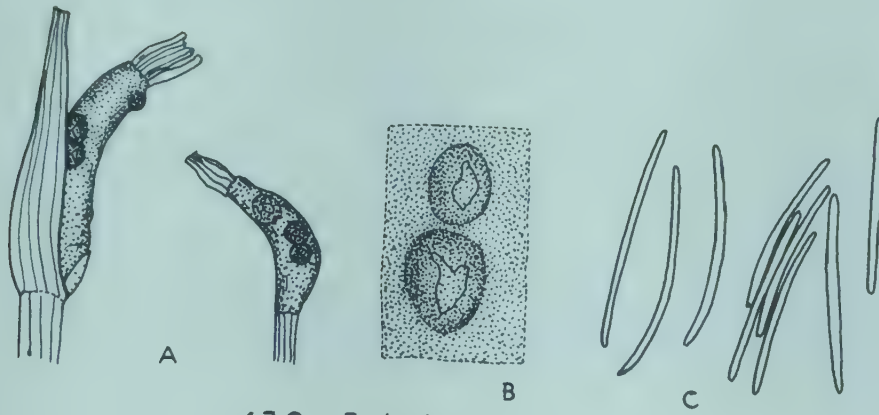
Fig. 433. *L. filicina*; original, from herbarium material on dead leaf stalks of *Dryopteris spinulosa*. A, B, habit of pycnidia; C, section through pycnidium; D, conidiophores and conidia.

434. PHAEOSEPTORIA Speg. Pycnidia dark, spherical, separate, ostiolate, subepidermal or erumpent; conidiophores simple, short; conidia yellowish to light brown elongate to filiform, several-celled, parasitic principally on grasses.

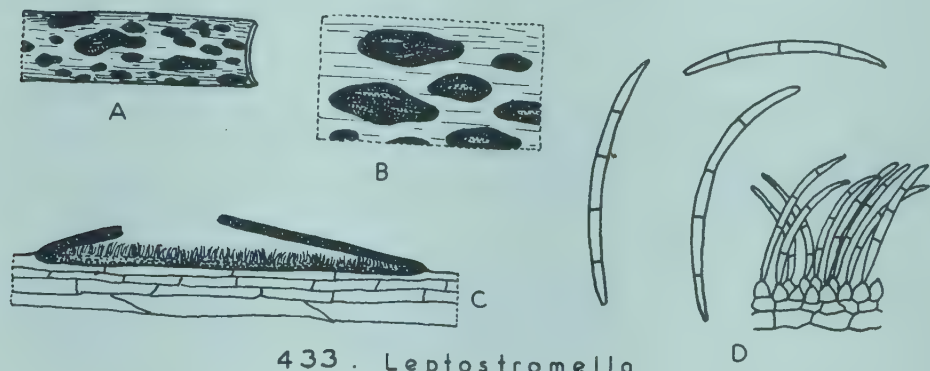
Fig. 434. *P. festucae* var. *muhlenbergiae*; original, from culture obtained from *Muhlenbergia*. A, pycnidium; B, conidiophores and immature conidia; C, mature conidia. Reference (241).

435. CORNULARIA Sacc. Pycnidia dark, cylindrical, bulbous at the base, or clavate, usually in tufts or groups; conidia hyaline to colored, several-celled, fusoid to greatly elongated; parasitic or saprophytic.

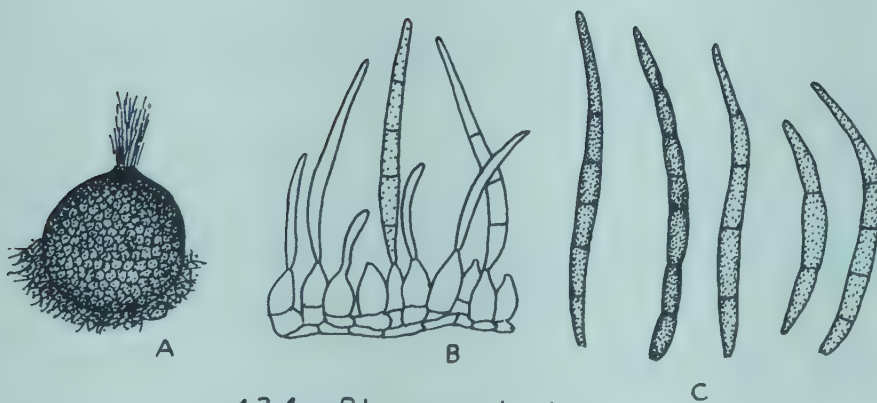
Fig. 435. *C. persicae*; original, from herbarium material on twig of *Prunus*. A, B, pycnidia; C, conidia.



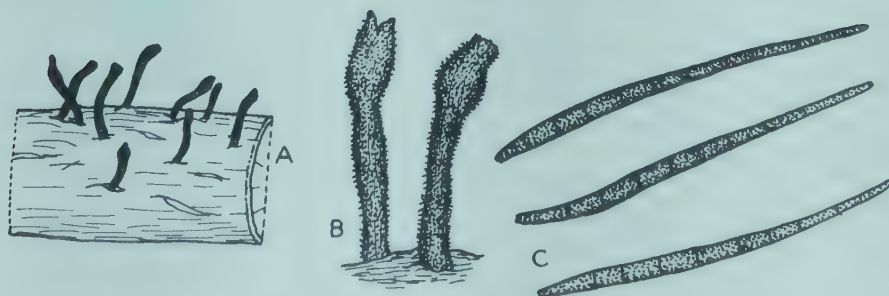
432. *Ephelis*



433. *Leptostromella*



434. *Phaeoseptoria*



435. *Cornularia*

436. CHONDROPODIUM Hohnel. Pycnidia stromatic, stalked, columnar, externally black, hard, internally gelatinous; conidiophores simple; conidia hyaline, several-septate, crescent-shaped or sickle-shaped; weakly parasitic or saprophytic.

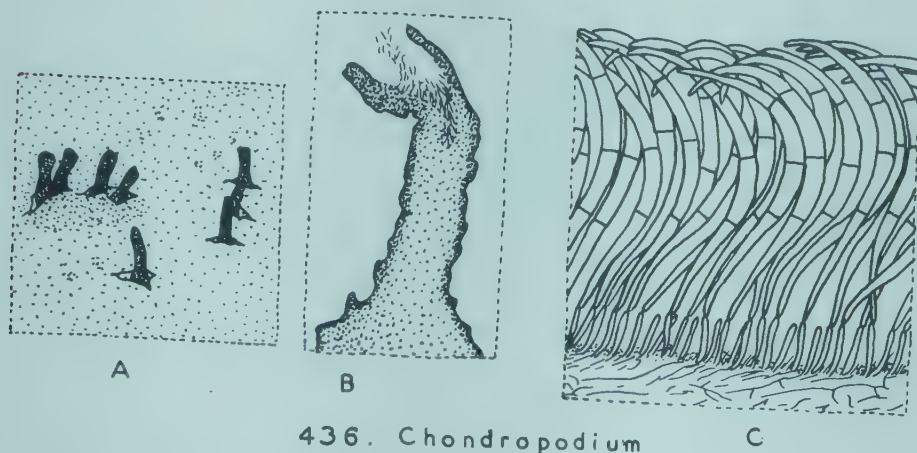
Fig. 436. *C. pseudotsugae*; A, habit of pycnidia; B, section through pycnidium; C, conidiophores and conidia; A, B, drawn from photographs; C, from drawing; from White (290).

437. CAMAROSPORIUM Schutz. Pycnidia black, erumpent, globose, separate, ostiolate, papillate; conidiophores short, simple; conidia dark, ovoid to ellipsoid, with several cross walls and a few longitudinal or oblique walls; saprophytic on twigs.

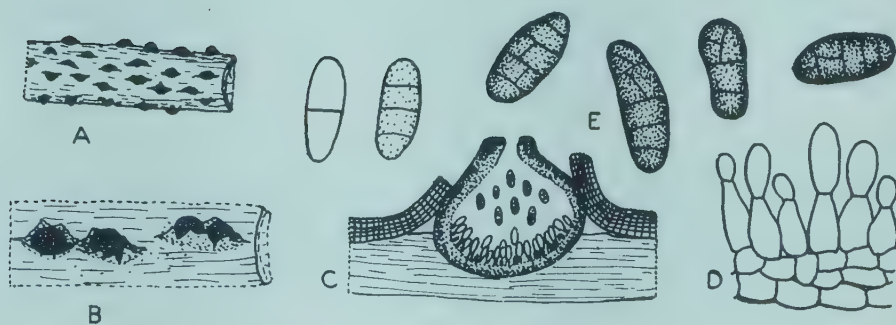
Fig. 437. *C. robiniae*; original, from herbarium material on dead twigs of *Robinia pseudoacacia*. A, B, habit of pycnidia; C, section of pycnidium; D, conidiophores and immature conidia; E, mature conidia.

438. DICHOMERA Cooke. Pycnidia black, grouped on stroma, bursting out of bark, globose, ostiolate; conidiophores simple; conidia dark, globose, ovoid or ellipsoid, several-celled with oblique septa; saprophytic.

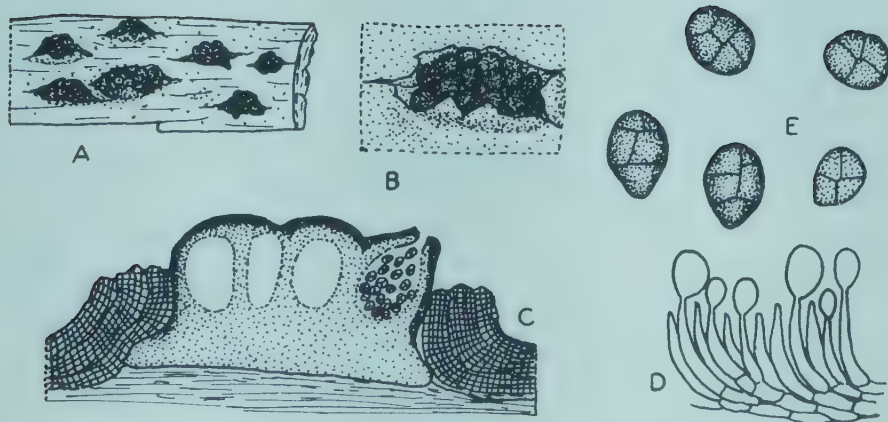
Fig. 438. *D. prunicola*; original, from herbarium material on twigs of *Prunus virginiana*. A, B, habit of pycnidia; C, section of stroma and pycnidia; D, conidiophores and immature conidia; E, mature conidia.



436. *Chondropodium*



437. *Camarosporium*



438. *Dichomera*

439. SCHIZOTHYRELLA Thrm. Pycnidia innate or superficial, membranous at first closed then opening irregularly, center hazy, colored; conidia hyaline or subhyaline, many-celled, cylindrical to filiform, separating into single cells; saprophytic.

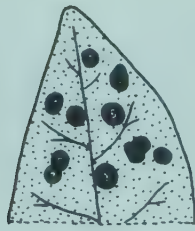
Fig. 439. *S. fraxini*; original, from herbarium material on dead leaves of *Fraxinus*. A, habit of pycnidia; B, section of pycnidium; C, conidia.

440. MERISMELLA Syd. Pycnidia orbicular, thin dark to light, with long pointed setae; conidiophores basal, cylindrical, septate; conidia long, slender, cylindrical to filiform, many-celled, hyaline, breaking up into 1-celled fragments.

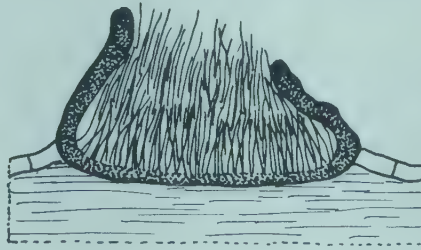
Fig. 440. *M. concinna*; redrawn from Batista *et al.* (18). A, pycnidium with setae; B, conidiophores and conidia.

441. BISBYOPELTIS Batista and Vital. Pycnidia subcuticular, rounded, thin, shield-like, brown, dehiscing irregularly; margin membranous, hyaline, setose; conidiophores basal, simple or branched; conidia arranged verticillately, filiform, several-celled, hyaline, not breaking up.

Fig. 441. *B. phoebesii*; redrawn from Batista *et al.* (18). A, portion of pycnidial wall; B, conidiophores and conidia.

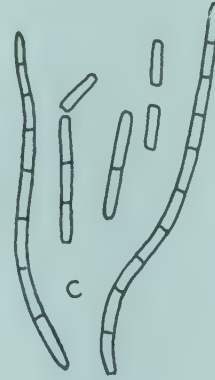


A



B

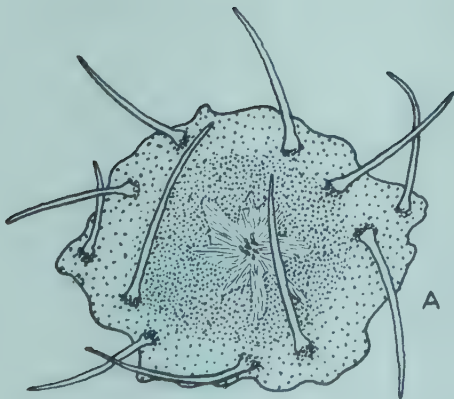
439. *Schizothyrella*



C

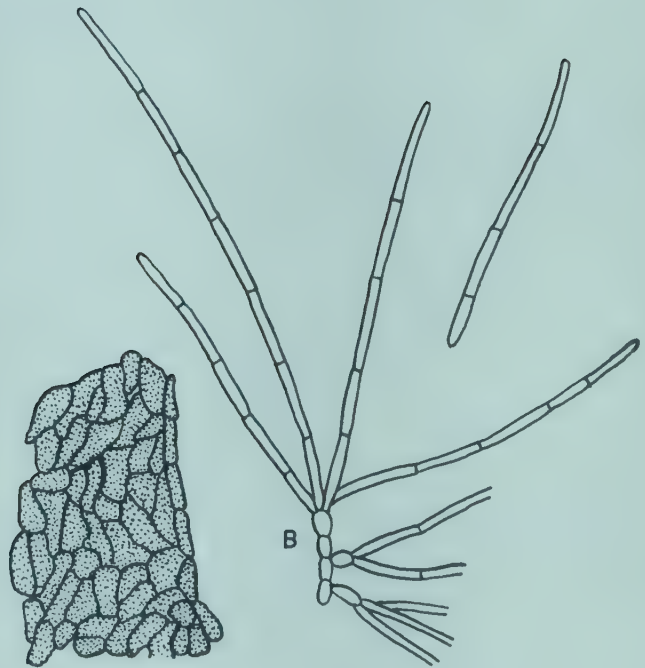


B

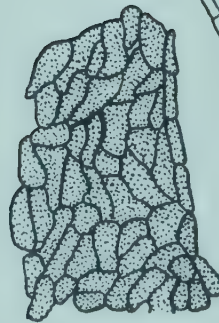


A

440. *Merismella*



B



A

441. *Bisbyopeltis*

MELANCONIALES

442. SPHACELOMA de Bary. Acervuli disc-shaped or cushion-shaped, waxy; conidiophores simple, closely grouped or compacted, arising from a stroma-like base, sometimes almost appearing as a sporodochium; conidia hyaline, 1-celled, ovoid or oblong; parasitic; imperfect stages of *Elsinoe*; similar to *Gloeosporium* and *Colletotrichum*.

Fig. 442. *S. ampelinum* (*Elsinoe ampelina*); original, from herbarium material on grape twigs and fruit. A, habit on twig; B, portion of acervulus on twig; C, portion of acervulus on fruit; D, conidia.

443. COLLETOTRICHUM Corda. Acervuli disc-shaped or cushion-shaped, waxy, subepidermal, typically with dark, spines or setae at the edge or among the conidiophores; conidiophores simple, elongate; conidia hyaline, 1-celled, ovoid or oblong; parasitic; imperfect stages of *Glomerella*. This genus differs from *Gloeosporium* in having spines, which may be absent under certain cultural conditions.

Fig. 443. *C. lindemutheanum*; original from prepared slide and from culture. A, section of acervulus from prepared slide; B, conidiophores, conidia and spines from culture; C, conidia.

444. GLOEOSPORIUM Desm. and Mont. Acervuli subepidermal erumpent, disc-shaped or cushion-shaped, waxy; conidiophores simple, variable in length; conidia hyaline, 1-celled, ovoid to oblong, sometimes curved; parasitic, chiefly on leaves or fruits; mostly conidial stages of *Glomerella*.

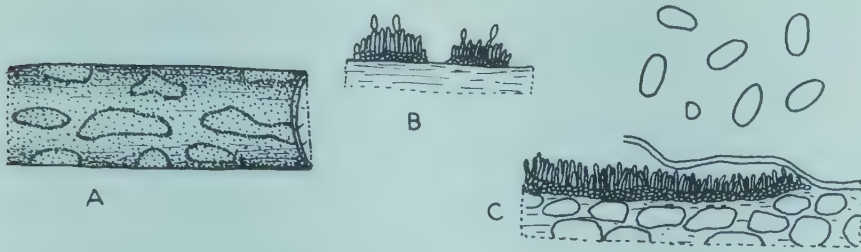
Fig. 444. A-C, *G. nervisequum* (*Gnomonia veneta*); D-F, *G. fructigenum* (*Glomerella cingulata*); original, from fresh material on *Platanus* leaves and from culture. A, habit of fungus; B, section through acervulus; C, conidiophores and conidia; D, acervuli produced in culture; E, conidia; F, conidiophores and free conidia in culture.

445. CATENOPHORA Luttrell. Acervulus cushion-shaped; conidiophores simple, septate, elongate; conidia hyaline, 1-celled, ellipsoid, produced on lateral sterigmata, one per cell of the conidiophore; parasitic.

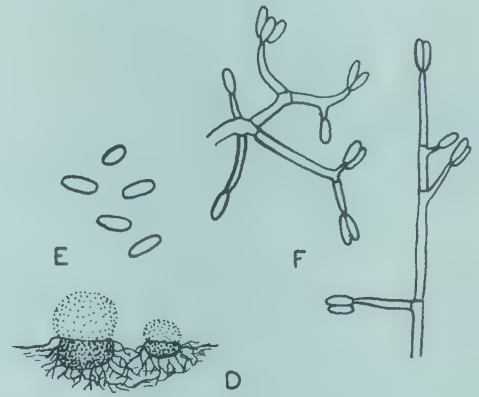
Fig. 445. *C. pruni*; A, section through acervulus; B, conidiophore producing conidia; C, conidia; redrawn from Luttrell (186).

446. PESTALOZZIELLA Sacc. and Ellis. Acervuli subcuticular; conidiophores slender, simple or branched; conidia hyaline, 1-celled, ovoid or oblong, with a hyaline branched appendage at the apex; parasitic.

Fig. 446. *P. subsessilis*; original, from herbarium material on leaves of *Geranium caroliniana*. A, habit on leaf; B, conidiophores and conidia; C, conidia.



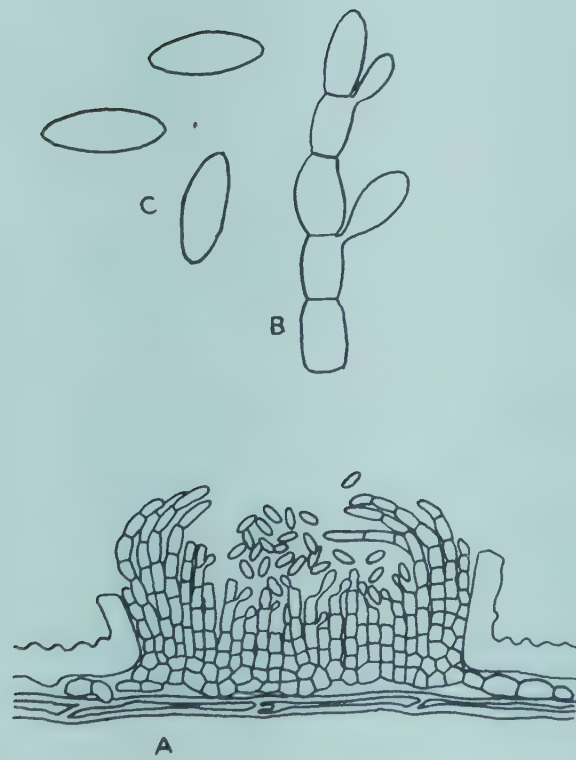
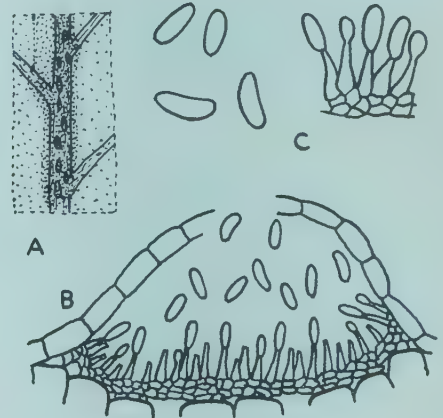
442. *Sphaceloma*



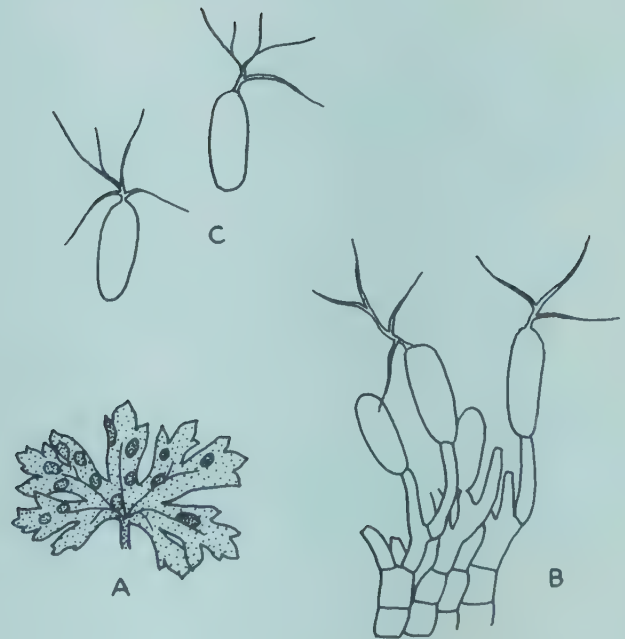
444. *Gloeosporium*



443. *Colletotrichum*



445. *Catenophora*



446. *Pestalozziella*

447. MELANCONIUM Link. Acervuli subepidermal or subcortical, conic or discoid, black; conidiophores simple; conidia dark, 1-celled, ovoid to ellipsoid or oblong; parasitic or saprophytic.

Fig. 447. *M. oblongum*; original, from herbarium material on dead twigs of *Juglans cinerea*. A, habit of acervuli; B, section through acervulus; C, conidiophores and conidia.

448. LEPTODISCUS Gerdemann. Acervuli superficial, shield-like, yellow to brown; stroma a single layer of cells bearing conidia; conidiophores obsolete; conidia hyaline, 2-celled, allantoid, with a filamentous appendage at each end; parasitic.

Fig. 448. *L. terrestris*; A, spore bearing upper surface of acervulus; B, section through acervulus; C, conidia; A, drawn from unpublished photograph furnished by J. W. Gerdemann; B, C, drawn from photographs from Gerdemann (105).

449. MARSSONINA Magn. Acervuli subepidermal, discoid, pale; conidiophores short, simple; conidia hyaline, 2-celled, ovoid to elongate; parasitic, chiefly on leaves.

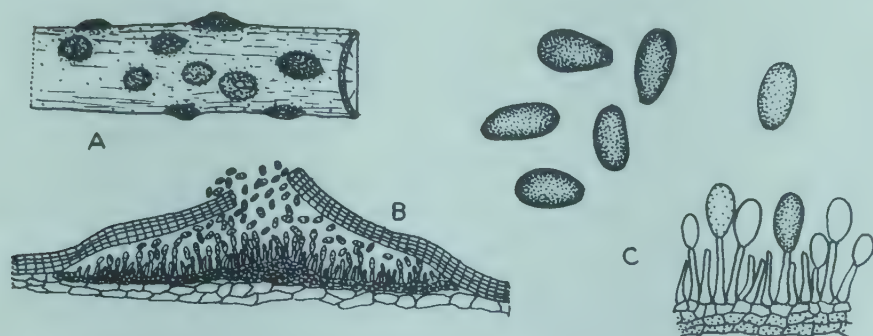
Fig. 449. *M. populi*; original, from herbarium material on leaves of *Populus*. A, habit on leaf; B, section through acervulus; C, conidiophores and conidia.

450. SEPTOGLOEUM Sacc. Acervuli subepidermal, erumpent, pale; conidiophores short, simple, conidia hyaline, several-celled, oblong to fusoid; parasites on leaves.

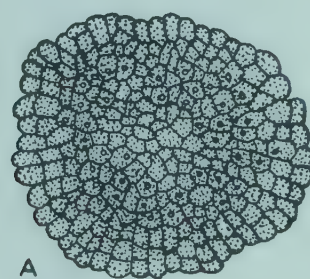
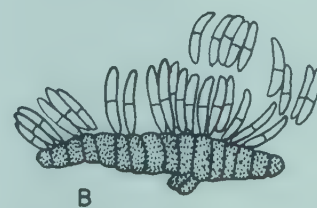
Fig. 450. *S. profusum*; original, from herbarium material on leaves of *Ulmus americana*. A, B, habit of acervuli; C, section through acervulus; D, conidiophores and conidia.

451. CRYPTOSPORIUM Kunze. Acervuli erumpent, becoming cup-shaped or disc-shaped, stroma brownish; conidiophores simple or branched; conidia hyaline or subhyaline, 1-celled, elongate, falcate; parasitic.

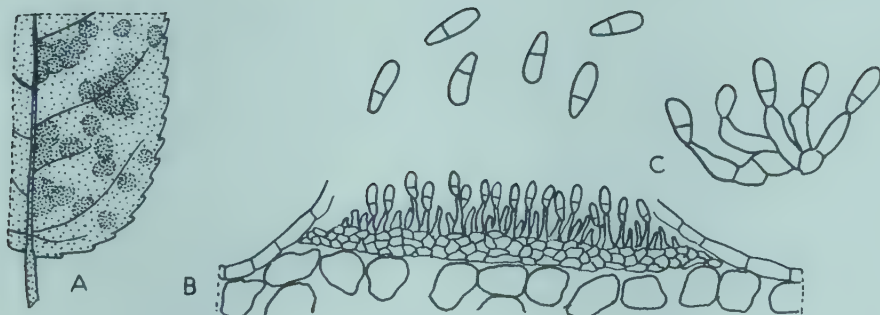
Fig. 451. *C. pinicola*; A, section through acervuli; B, conidiophore and conidial; redrawn from Linder (185).



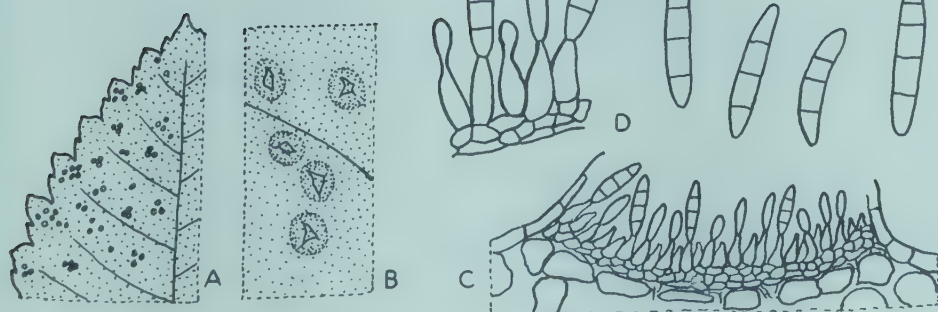
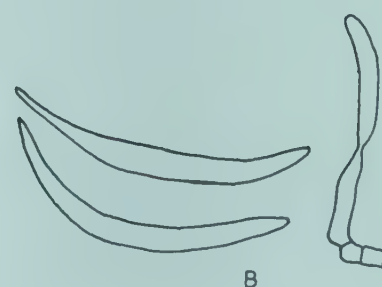
447. *Melanconium*



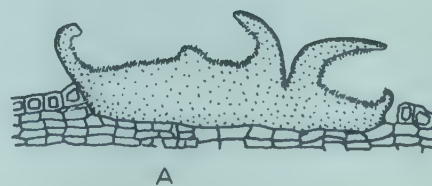
448. *Leptodiscus*



449. *Marssonina*



450. *Septoglœum*



451. *Cryptosporium*

452. *LIBERTELLA* Desm. Acervulus subcortical, erumpent, yellow to red; conidiophores branched; conidia hyaline, 1-celled, filiform; saprophytic.

Fig. 452. *L. betulina*; original, from herbarium material on bark of *Betula lutea*. A, habit of acervuli; B, section through acervulus; C, conidiophores; D, conidia held together in matrix; E, separate conidia.

453. *CLYINDROSPORIUM* Unger. Acervuli subepidermal, white or pale, discoid or spread out; conidiophores short, simple; conidia hyaline, filiform, straight or curved, 1-celled or becoming septate; parasitic on leaves.

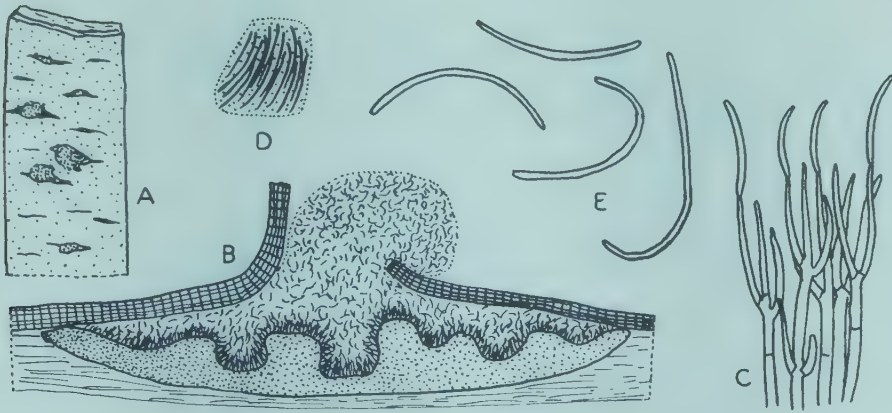
Fig. 453. *C. padi* (*Coccomyces hiemalis*); original, from dried material on cherry leaves. A, B, habit of acervuli; C, section through acervulus; D, conidiophores and conidia.

454. *MONOCHAETIA* Sacc. Acervuli dark, discoid or cushion-shaped, subepidermal; conidiophores slender, simple; conidia dark several-celled with hyaline pointed end cells, elongate to fusoid, with a single apical appendage; parasitic.

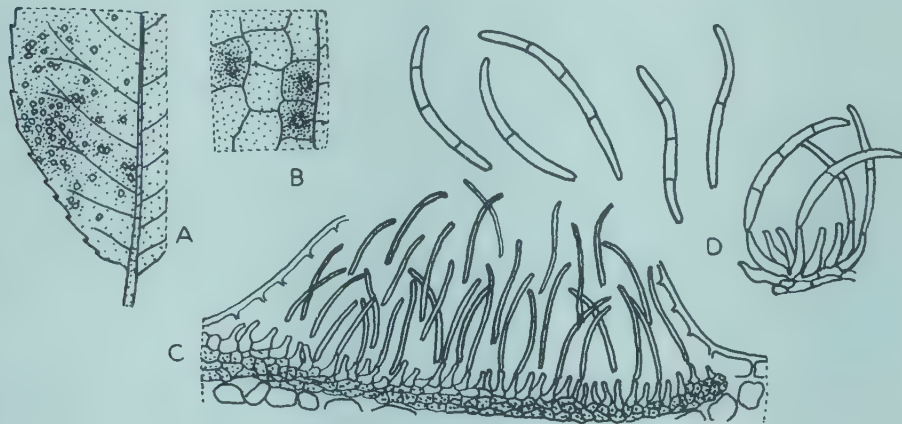
Fig. 454. *M. mali*; original, from herbarium material on apple leaf. A, habit on leaf; B, section through acervulus; C, conidiophores and conidia.

455. *PESTALOTIA* de Not. Acervuli dark, discoid or cushion-shaped, subepidermal; conidiophores short, simple; conidia dark, several-celled, with hyaline, pointed ends cells, ellipsoid to fusoid, with two or more hyaline, apical appendages; parasitic.

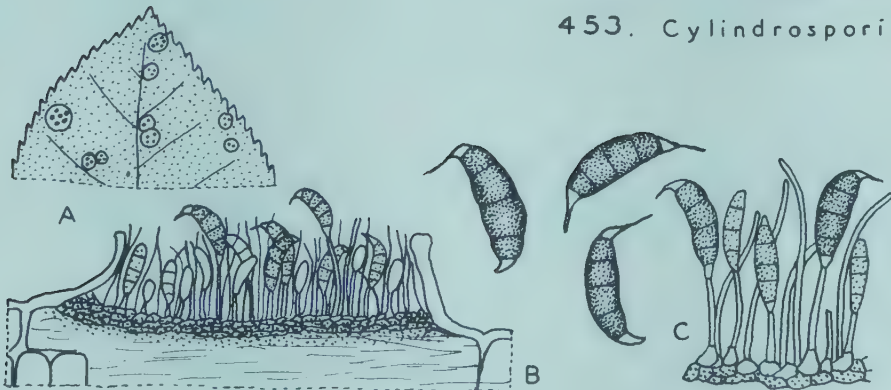
Fig. 455. *P. macrotricha*; original, from fresh material on leaves of *Rhododendron*. A, B, habit of acervuli; C, section through acervulus; D, conidiophores; E, conidia.



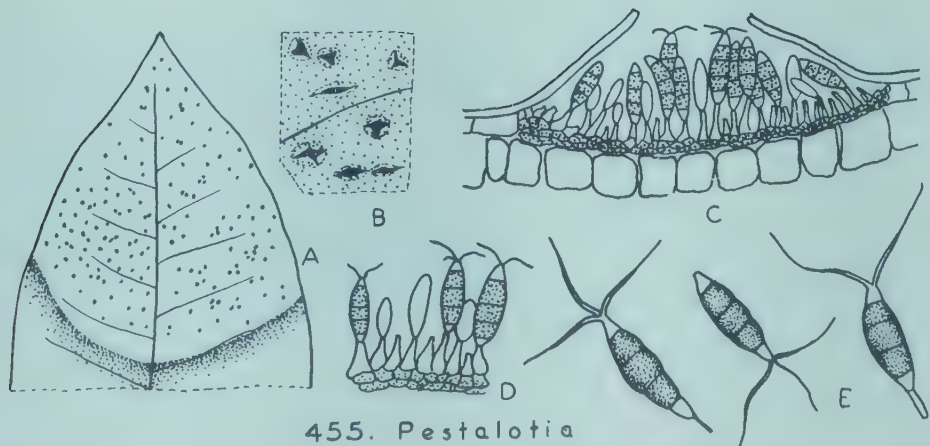
452. *Libertella*



453. *Cyindrosporium*



454. *Monochaetia*



455. *Pestalotia*

456. CORYNEUM Nees. Acervulus subcutaneous or subcortical, black, cushion-shaped to disc-shaped; conidiophores slender, simple; conidia dark, several-celled, oblong to fusoid; parasitic or saprophytic.

Fig. 456. *C. kunzei*; original, from fresh material on oak twigs. A, habit of acervuli on twig; B, section through acervulus; C, conidiophores and conidia.

457. ENTOMOSPORIUM Lev. Acervulus subcuticular, discoid, dark; conidiophores short, simple; conidia hyaline, 4-celled, cross-shaped, the two lateral cells smaller, all except the basal cell equipped with a slender bristle; parasitic on leaves and fruit.

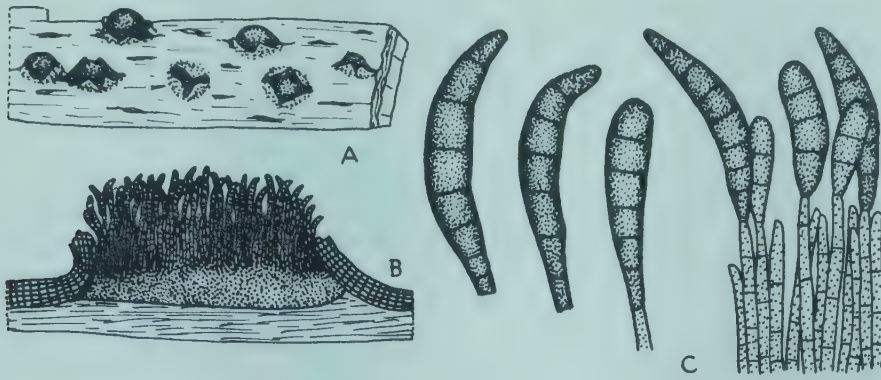
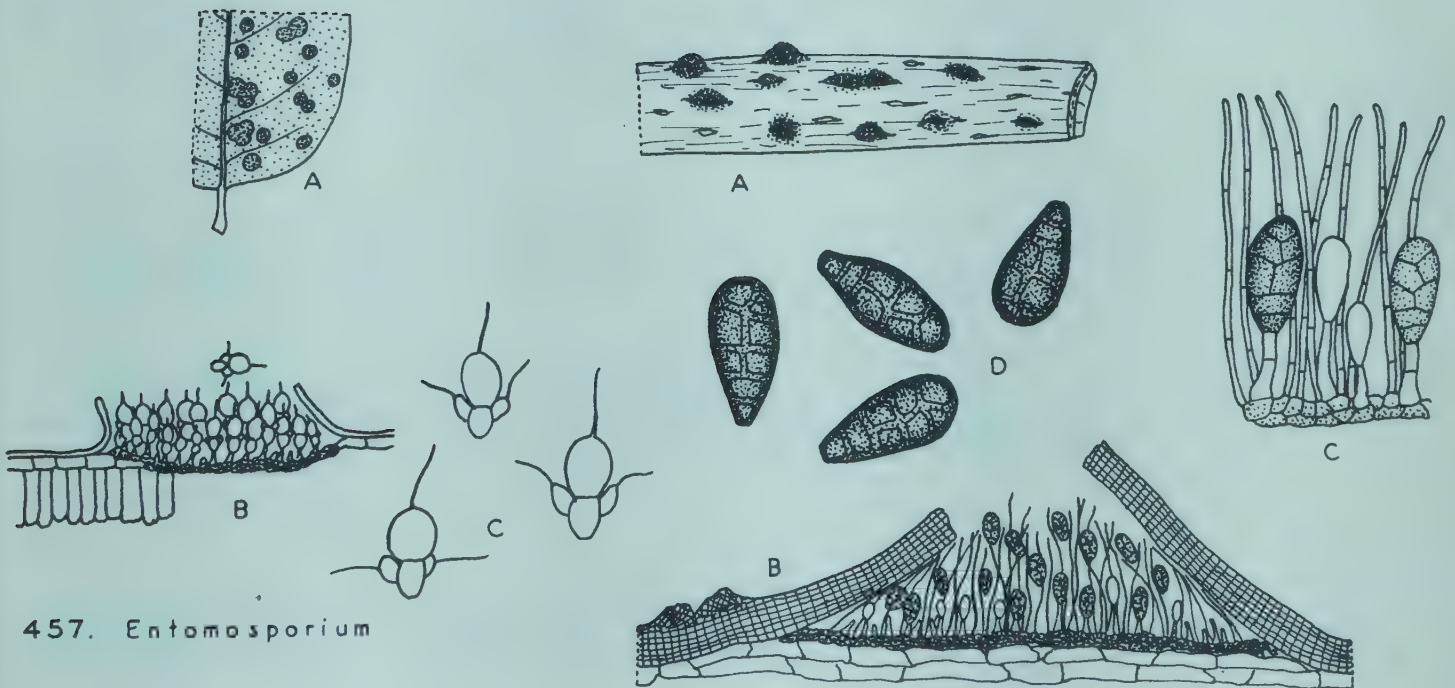
Fig. 457. *E. maculatum* (*Fabrea maculata*); original, from herbarium material on leaves of *Cydonia*. A, habit on leaf; B, section through acervulus; C, conidia.

458. STEGANOSPORIUM Corda. Acervuli subcortical, dark, cushion-shaped; conidiophores simple; conidia dark, muriform, ovoid, oblong or pear-shaped; saprophytic on wood.

Fig. 458. *S. pyriforme*; original, from fresh material on bark of *Acer*. A, habit of acervuli; B, section through acervulus; C, conidiophores, conidia and sterile hyphae; D, conidia. Reference (199).

459. ASTEROSPORIUM Kunze. Acervuli bursting through bark; conidiophores slender, simple; conidia dark, typically 4-armed, each arm septate; saprophytic.

Fig. 459. *A. hoffmanni*; redrawn from Archer (7).

456. *Coryneum*457. *Entomosporium*458. *Steganosporium*459. *Asterosporium*

MYCELIA STERILIA

460. RHIZOCTONIA DC. Asexual fruit bodies and spores lacking; sclerotia brown or black, variable in form, frequently small and loosely formed, formed among and connected by mycelial threads; hyphae of mycelium brown, with long cells, septa of branch set off from main hypha; parasitic, chiefly on roots and other underground parts of plants.

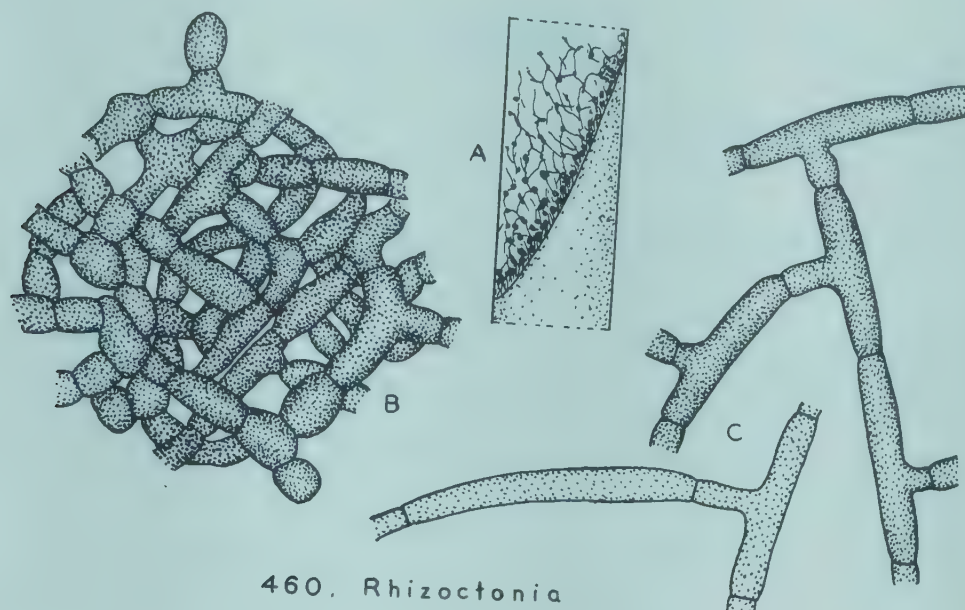
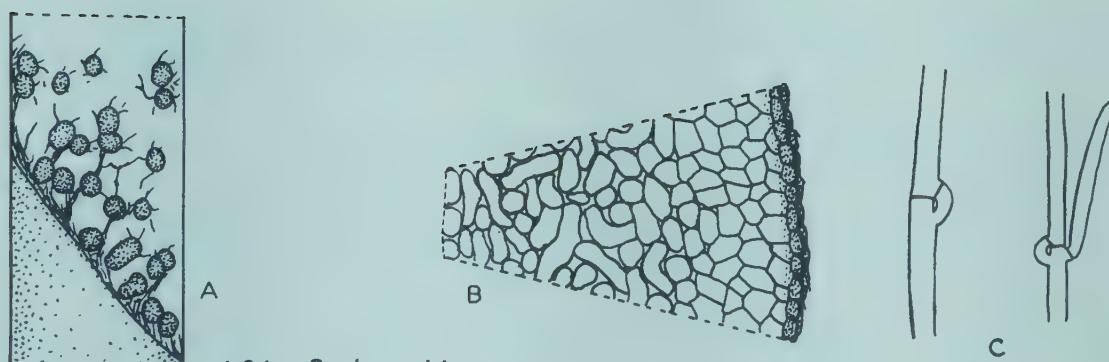
Fig. 460. *R. solani* (*Pellicularia filamentosa*); original, from culture. A, small sclerotia and mycelium in tube culture; B, section of loose sclerotium; C, cells of mycelium.

461. SCLEROTIUM Tode. Asexual fruit bodies and spores lacking; sclerotia brown to black, globose or irregular, compact; mycelium usually light; parasitic, principally on underground parts of plants.

Fig. 461. *S. (Pellicularia) rolfsii*; original, from culture; A, sclerotia in tube culture; B, portion of section of sclerotium; C, portions of mycelium showing clamp connections.

462. PAPULASPORA Preuss. Asexual spores lacking; mycelium light,^{*} producing compact clusters of small cells or bulbils which are sclerotium-like and serve to reproduce the fungus; saprophytic.

Fig. 462. *P. magnifica* (a stage of *Ascobolus magnificus*); redrawn from Seaver (228). Other reference (122).

460. *Rhizoctonia*461. *Sclerotium*462. *Papulaspora*

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